March 1942

THE FOUNDRY

FIFTIETH YEAR

FLAGS OF NATIONS WHICH SIGNED UNITY PACT AT WASHINGTON JANUARY 2, 1942.

CHAMPION

FOUNDRY AND MACHINE CO. • 1316 WEST 21st ST. • CHICAGO, ILL.

NOW...MORE THAN EVER YOU NEED *Purite*

To Give You Better, Stronger, Cleaner Castings!

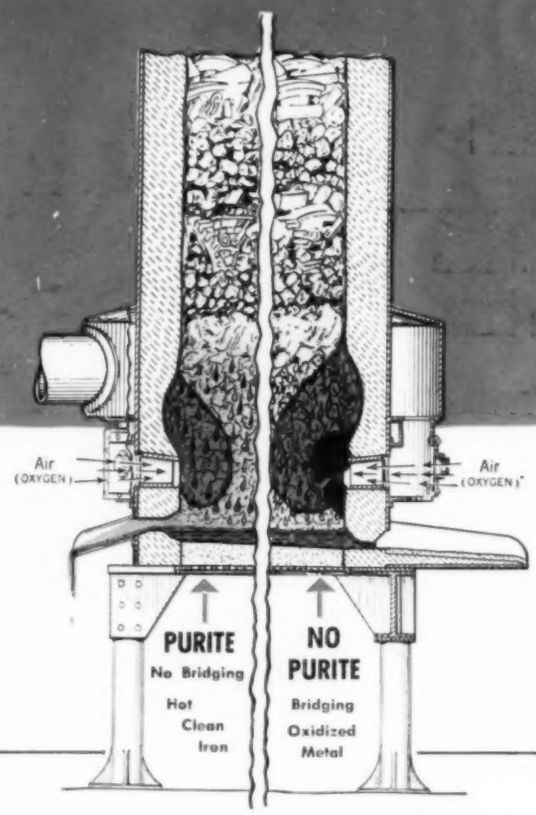
All over the country foundries large and small are stepping up their production to meet the increased demand for gray iron and semi-steel castings. This increased demand makes it vital that foundrymen turn out castings that are *sounder, better* machining. There can be no lag in production due to defective castings.

PURITE In The Cupola Makes *Cleaner* Castings!

PURITE increases the fluidity and activity of the cupola slag, acts as a catalyst in speeding up combustion. This results in higher melting temperatures, less oxidation, lower sulphur and hot *clean* iron.

Progressive foundrymen have found that they can reduce the weight of fluxing materials required for making an active fluid slag by using PURITE in the ratio of 1 lb. to each 10 lbs. of limestone or 2 to 4 lbs. of PURITE with 20 to 40 lbs. of stone per ton of cupola charge. In this way PURITE saves coke, reduces oxidation by the blast and helps keep the cupola running smoothly.

Order a trial bag, or ton, today and let PURITE prove itself in *your* foundry!



CROSS-SECTION OF CUPOLA SHOWING HOW PURITE WORKS

1. PURITE keeps the tuyers open and bright during long heats and prevents bridging—gives a clean drop at the finish.

2. PURITE restricts the uncombined oxygen in the blast or the combustion zone to a smaller, hotter area in front of the tuyers and prevents oxidation of the metal.

PURITE

THE SCIENTIFIC FLUX FOR BETTER MELTING AND CLEANER IRON

THE MATHIESON ALKALI WORKS (INC.)
60 EAST 42ND STREET, NEW YORK, N. Y.
(Licensee of Metallurgical Development Company, Inc.)

THE PRESSURE IS ON...

This large herringbone gear, made by William Thropp and Sons Company, Trenton, N. J., is but one example of the use of Silvery Mayari in producing sound, efficient tools for war purposes. This casting is the master gear in a 20 x 54-inch 3-roll calender, used in the rubber and plastic industries.

SILVERY MAYARI

Bethlehem is producing both Mayari and Silvery Mayari in as large quantities and as fast as it is possible to make these important alloy irons. They are helping to turn out sound, strong, readily-machinable castings for the American industrial-military machine.

We know that many of our friends and customers have made great sacrifices to throw their weight behind the present war effort. Although it is impossible to supply everyone with as much iron as he may desire, we want to point out that we have no shortage in practical foundry experience. If you have a ticklish alloy-iron casting problem and would like advice, call in a Bethlehem foundry specialist. Bethlehem men are always ready, willing and able to answer your call for consultation. There is no obligation, of course.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

DO YOU GAMBLE?

● The answer, of course, is "Yes" because in some way, shape, or manner, we all gamble.

In the interests of progress in fact, it frequently becomes *necessary* to gamble. The old saw "Nothing ventured, nothing gained" is as true now as when it was written.

On some things and at some times, however, it's wiser *not* to gamble. Surrounded by scarcities, priorities, restrictions, and allocations and driven by the desire to get the most done in the least possible time, the wise foundryman will *NOT* gamble on the source of his foundry supplies.

To those who seek a reliable source of supply, one with stocks large enough to care for emergencies, and one with the experience of many years serving foundries, we suggest: TRY FEDERAL!

CHARLEROI SEACOAL

The finest Pennsylvania gas coal plus a grinding and screening process surpassed by none– that's Charleroi Seacoal.

Seven grades make it easy to select the right seacoal for each sand or job. Savings up to 20% have been realized by switching to Charleroi Seacoal.

More and more foundries are switching to Charleroi . . . Why not you?

FEDERAL GREEN BOND

Pure Wyoming Bentonite—the ideal sand bonding agent. Continuous laboratory control from mine to bag keeps it the best and removes the gamble from its use.

Years of experience and thousands of tons of reserve stock are behind every bag. Whether your shop is gray iron, malleable or steel, remember this fact:

You can't buy a better bond than Federal Green Bond!

THE FEDERAL FOUNDRY SUPPLY CO.

4600 East 71st Street • Cleveland, Ohio

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Mines: UPTON, WYO.

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FIRE!

Bronze Plant, Up From Ashes, Triples Output

BY JOHN P. LEACACOS

One hundred and twenty days, to the day, after a disastrous $2,000,000 fire destroyed its plant, the National Bronze & Aluminum Foundry Co. yesterday celebrated by announcing it had tripled its previous war production since starting from scratch. The company simultaneously launched the biggest foundry training program in the United States.

The production record, figures on which are a military secret, ran into millions of pounds of aluminum castings, parts for airplane motors, submarines and tanks which the company makes for the army and the navy.

The labor force was almost doubled to 1,500 persons, in comparison with last summer's employment, to make the production possible. The training program, just instituted with the co-operation of the Board of Education's training supervisors, the WPA and the War Production Board's training-within-industry division here, will train 1,000 workers in 14 weeks.

Holliday Hails Progress

Asserting that the fire which burned the National Bronze plant to the ground in September could not have been worse had Jap or Nazi bombers devastated the spot, W. T. Holliday, president of the Standard Oil Co. of Ohio and regional vice president of the National Association of Manufacturers, said last night in a statement:

"One week after the fire the company poured the first castings in the new half-roofed plant rising beside the ruins at E. 85th Street and Laisy Avenue S. E. Even before the fire was extinguished equipment was lined up and facilities arranged for at other foundries.

(Continued on Page 4, Column 4)

(Continued From First Page)

"Today, four months after, these men are producing three pounds of aluminum castings for war planes, ships and tanks for every one turned out before. These men are determined to double their output again —120 days from now."

Will Run "Assembly Line"

The program to train workers in the skills needed for this war industry will be an assembly line school, as it were, with men coming into the plant and others being graduated at the same time. The entire facilities of the company—machinery, plant and supervision—were turned over to the government agencies to prepare the program. The company was said to be the only one in the country to take this step.

The three phases of the teaching will center around making sand cores for the castings, locking the cores in flasks and pouring molten aluminum into the molds and then breaking open the molds and grinding down to the finished products.

Sparkplug of National Bronze is John Schmeller, executive vice president and one of five Schmeller brothers in the ousiness. The others are Joseph, Frank, Herbert and Edward.

Aiding in the training program have been John Fintz of the Cleveland Board of Education, Douglas Wilson of the Cleveland Employment Security Center, Arthur Zaller of WPA, James Goldy of the Cleveland Trade School, Elmer Reynolds of the Department of Labor apprentice service and Oscar Grother and L. O. Mellen, heads of the War Production Board's training-within-industry section here.

Reprinted from
The Cleveland Plain Dealer,
January 30, 1942.

Pictured in the circle are drums of Linoil, taken just after the fire. Heat and pressure distorted the drums but did not injure the Linoil.

Left: Part of a class, in what is said to be the biggest foundry training program in the United States, examining Linoil cores at National Bronze.

and quick COME-BACK of

THE NATIONAL BRONZE AND ALUMINUM FOUNDRY CO.

"All that we said in 1939 about our experience with Linoil is as true today as it was then. Now that we are 100% on war orders we appreciate more than ever Linoil's quality and dependability." Frank Schmeller, Foundry Superintendent.

LINOIL

Says Frank Schmeller, Foundry Superintendent of The National Bronze and Aluminum Foundry Company:

"We have used Linoil for twenty years, during which time we have tried out no less than a score of different core oils. It's always been the same story—back to Linoil in spite of attractive prices offered on competitive brands.

"Our experience has taught us that real economy in a core oil comes from uninterrupted production schedules. We like Linoil because it is reasonably fast-drying, knocks out clean, and works smoothly in the core boxes. So far, we have found no other oil that will do our particular job of high production with core blowers like Linoil, and would not hesitate to recommend it as the finest core oil we know of."

Reprinted from THE FOUNDRY, July, 1939

No matter how much apathy there be in some spots, the foundrymen have none of it. They know there is a war on, and how! Twenty-four hours a day, seven days a week for most of them, and on their toes every minute to think up some new way of increasing production.

Well, Linoil doesn't offer anything new to that host of foundrymen who have used it for years. In fact, the mere fact that there is no danger of anything new is one of Linoil's chief attractions for many users. The absolute confidence that every user can depend on every drum and every tankcar of Linoil running uniform is a tangible help in the war program.

Every foundry can avail itself of Linoil's assurance against loss of time and loss of material from core causes. At the same time it can speed up the core bench, the ovens, handling and core inspection, mold set up, and casting cleaning. America is at war—Keep the castings flying—Send for the Linoil man.

THE WERNER G. SMITH COMPANY

(DIVISION OF ARCHER-DANIELS-MIDLAND COMPANY)

2191 West 110th Street — Cleveland, Ohio

BARRELS, TABLES,

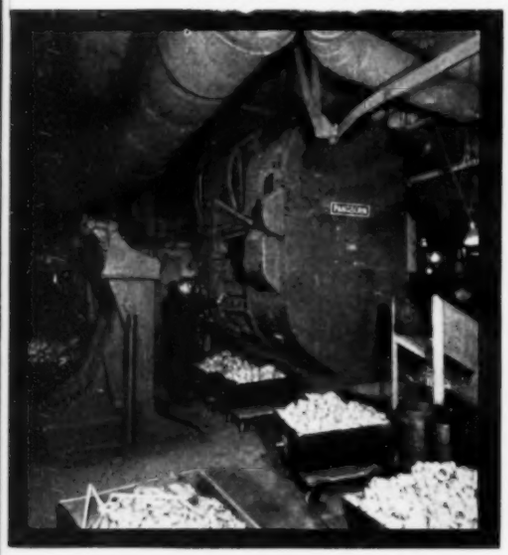
ROTOBL

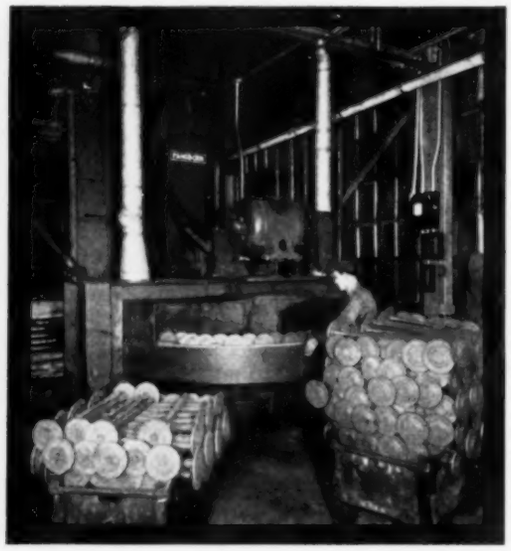
speeds

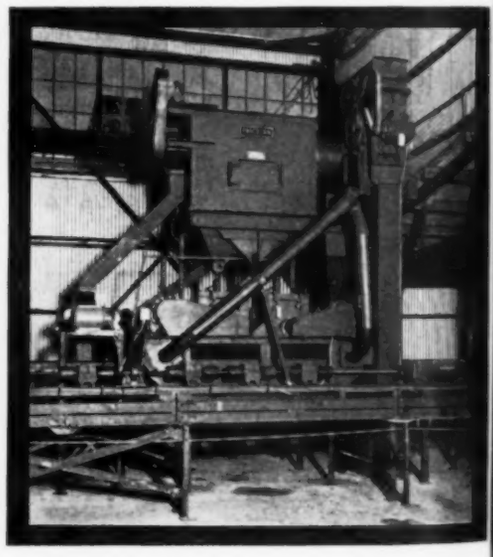
shells, guns, tanks, airplanes and ships are the real necessities today.

Right now—nothing counts but the greatest possible production of vital materials. Castings, forgings, heat-treated parts, bombs,

It's OUR JOB to SPEED UP the DELIVERY of these products—to get MORE work through MORE plants—FASTER and FASTER!







WORLD'S LARGEST MANUFACTURER OF BLAST

PANG

PANGBORN CORPORATION . . . . . .

ASTING

SPECIAL CABINETS.

work!

ROTOBLASTING speeds work! You can clean your products better—quicker—and for less cost if you use ROTOBLAST Airless equipment. Barrels for work that can be tumbled—Tables for fragile pieces—Cabinets for straight-line production.

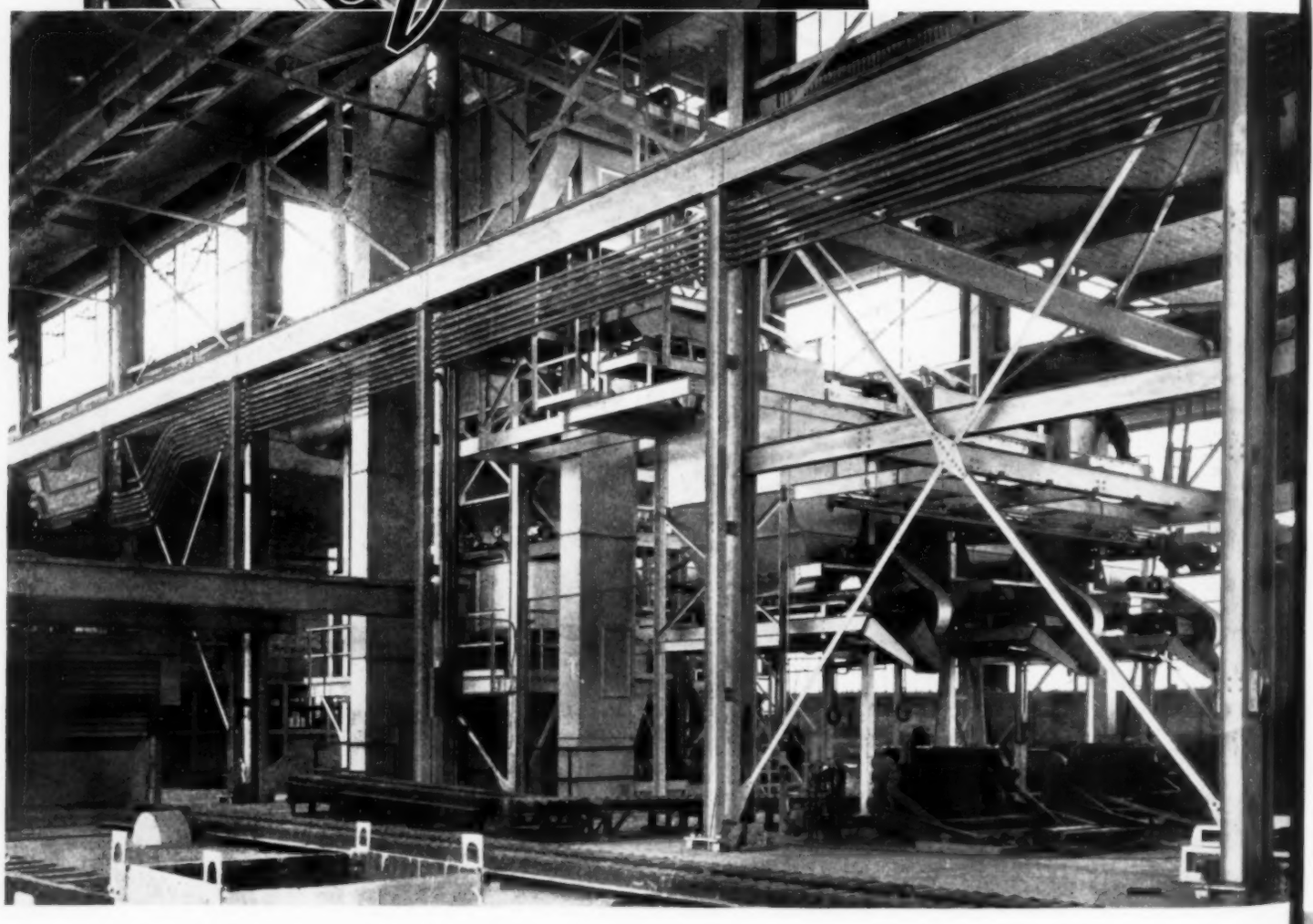
If it's SPEED you're after—plus BETTER cleaning — plus LOWER cost — come to PANGBORN! We are 100% on war work—turning out more and more equipment—and every machine we complete SPEEDS PRODUCTION!

CLEANING AND DUST CONTROL EQUIPMENT

BORN

HAGERSTOWN, MARYLAND

INCREASE PRODUCTION of Cast Steel BOMBS . . .



★ *Illustrated directly above is a general view of of the operating floor at the steel foundry mentioned at the right. In the right foreground are two roll-over jolt machines, which are fed with sand from chutes located directly above. The maximum efficiency under which this foundry operates is evident in the realization that the total number of rejects is less than 2 per cent. Simpson Mixers are doing their share in helping to maintain this record by providing the required capacity of correctly prepared backing, system and facing sand.*

...with SIMPSON INTENSIVE MIXERS

★ *At the left is a view of the No. 3—8 ft. diam. High Duty Simpson Intensive Mixer. Directly above is a view of one of two No. 3 units installed at a large steel foundry, producing steel bomb shells.*

"*From plowshare to sword*" is probably now descriptive of your foundry, or perhaps more accurately, "from automotive parts to bomb shells." If your steel foundry is faced with bomb production or other defense problems, it will pay you to get the facts about Simpson Intensive Mixers and auxiliary equipment, to help you obtain maximum production, highest quality, and greatest economy. For, regardless of the type of casting to be produced, these modern mulling units will give you absolute control of one of the most important phases of foundry production—*correct sand preparation.*

Here's a case in point: A large steel foundry is now producing cast steel bomb bodies in large quantities. Specifications provide for nothing except absolute perfection, with tolerances practically nil. Two sand and mold handling systems are used, engineered and installed by "National". To assure correct sand control and preparation, two No. 3 High Duty Simpson Intensive Mixers of 3,000 lbs. batch capacity are used. Backing and system sand is prepared at the rate of 45 tons per hour per machine. Facing sand is mulled at the rate of 20 tons per hour per unit. There are no hot sand conditions, even though the sand-to-metal ratio in flasks is less than 1 to 1. In a year's operation, working three shifts per day, plows and one wearplate were the only mixer part replaced.

Need we say more? If you're looking for this kind of performance, get further details about Simpson Intensive Mixers today!

SIMPSON
INTENSIVE
MIXERS

NATIONAL ENGINEERING COMPANY

MACHINERY HALL BUILDING • CHICAGO, ILLINOIS

Manufacturers and Selling Agents for Continental European Countries:—The George Fischer Steel & Iron Works, Schaffhausen, Switzerland. For the British Possessions, Excluding Canada and Australia—August's Limited, Halifax, England. For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battle & Co., Pty., Ltd. Sydney, Australia

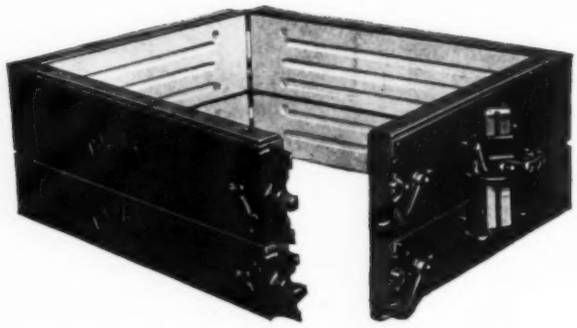
ADAMS
Flasks
and
Jackets

ADAMS CAST IRON JACKET

The combination of horizontal and vertical ribs, added to the machined corner construction, gives this jacket unusual rigidity.

ADAMS STEEL JACKET

The strongest and most rigid jacket on the market. It will effectively handle the most difficult jobs.



ADAMS CHERRY SNAP FLASK

The standard of quality for more than forty years. Made with straight sides or with any desired taper.

ADAMS CHERRY SLIP FLASK

A very convenient flask for machine or bench. Available in any size or depth.

●

Adams Flasks can be fitted with either the wide-V pin (as illustrated) or with the double-V pin. Our improved lever latches can be applied to the snap flasks when desired.

THE ADAMS COMPA

MOLDING MACHINES · FLASK

THE ADAMS POST TYPE JOLT SQUEEZER

When you first see this machine, you are impressed with its clean lines and the absence of any exposed mechanisms.

When you operate this machine, its speed and convenience are most pronounced. One movement of the operating lever brings the head into position and squeezes the mold.

Made with 10" and 12" cylinders, stationary and portable. Standard equipment includes jolt and vibrator knee valves (adjustable in height), pressure regulator, pressure gauge, automatic oiler and blow valve, also a side shelf and a riddle rack on the portable machine.

Side rod type machines are available with 10", 12" and 16" cylinders, stationary and portable.

NY · DUBUQUE, IOWA · U.S.A.

EQUIPMENT Established 1883

NEW PRINCIPLE TRIPLES HEAT TREATING PRODUCTION . . . KEEPS WORK STRAIGHTER . . . WITH SUBSTANTIAL COST REDUCTION!

All the advantages of 100% FORCED CONVECTION HEATING Now Available for Temperatures to 1750°

MUST YOU quickly increase heat treating production in a limited floor area? Does your work distort badly in heating or quenching? Is your present equipment unable to meet required heating accuracies? If you are faced with any of these conditions, then the Super Cyclone can help you. Here's a brand new heating principle that completely explodes heating theories which the text books have proclaimed for years. Using 100% forced convection heating for such operations as hardening, annealing, normalizing, etc. this new heating principle has *seldom* failed to triple or quadruple production, hold distortion to closer limits than any other heating method used before, or cut heating and handling costs far below those previously experienced.

Heat treaters have realized for years that forced convection heating should be the ideal method for heating in the hardening and annealing ranges. Faster heating, greater production and more uniform heating of heavy charges would obviously be the result *if* forced circulation could be utilized for the high temperatures. But tradition and textbook theories . . . having authority only because of their age . . . had chained and shackled development of practical equipment utilizing the advantages of high temperature forced circulation heating. Tradition said it wasn't practical . . . . that Heat could *not* be successfully transmitted by 100% forced convection at temperatures above 1300° F.

LINDBERG ENGINEERS DO IT

Experience in designing several thousand Cyclone Tempering Furnaces which utilize forced convection for temperatures to 1250° F. indicated to Lindberg Engineers that there was no logical reason to limit the temperature range of forced convection. There were, of course, plenty of mechanical problems to be solved . . . but basically, why couldn't it be done? Why not build a high temperature forced convection heated furnace and find out? Eighteen months ago they built the furnace . . . put it into 24-hour a day production service . . . . the first Super-Cyclone. *It was a success from the start.* As the weeks rolled on a careful and continuous study was made of its operation. Minor weaknesses were systematically eliminated . . . fan design modified in the light of practical operating experience . . . . construction changes made here and there . . . . but basically the Super-Cyclone is today the same furnace that went to work under production conditions 18-months baek.

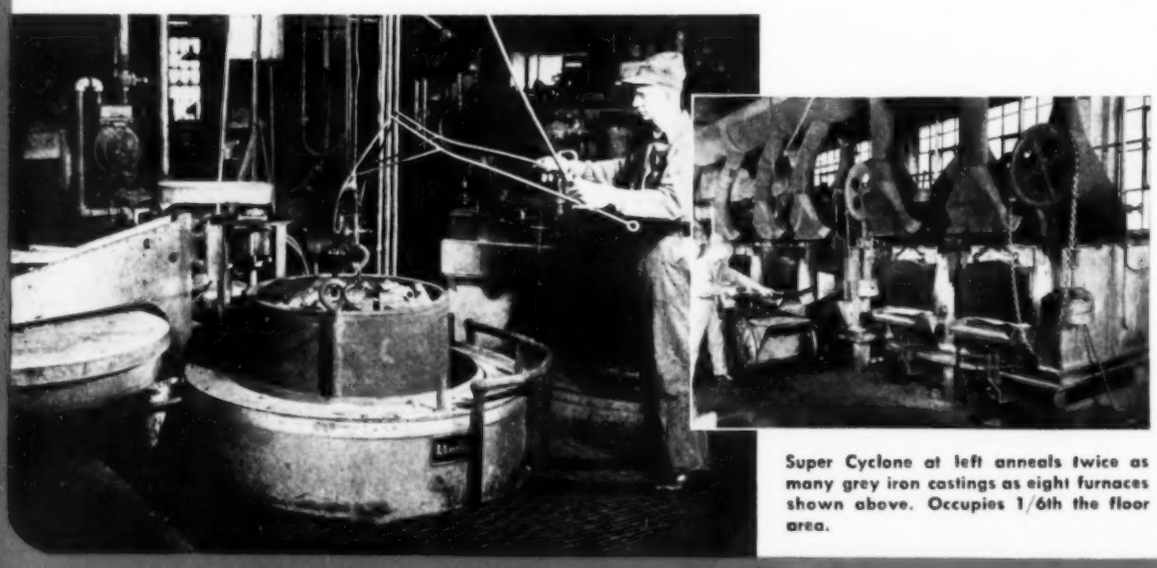
ADVANTAGES QUICKLY APPARENT

This new heating principle completely eliminated distortion . . . . or cut it to practically nothing. For example in hardening of SAE 4140 worm gears weighing 20 lbs. each: Using Box Furnace hardening, 85% of the gears distorted from .015" to .025", and required considerable straightening time. *When this job was heated and quenched from the Super Cyclone 90% of the gears required no straightening whatsoever,* and the balance was out a maximum of only .010", easily and quickly taken care of with the press.

Fifty thousandths grinding stock had been required on ring gears from 24 to 36" dia., to take care of distortion which occurred when heat treated in box type hardening furnaces. When heat treated in the Super Cyclone the customer found that grinding stock could be reduced to .020" . . . *thirty thousandths grinding stock saved!*

HEAVY PRODUCTION INCREASES

Older heating methods such as radiation heated box type furnaces are limited to a single layer of parts loaded on the hearth . . . . and even then can rarely heat a heavy load uniformly. This is in decided contrast to the Super Cyclone in which work is *piled up* for handling. In hardening from the Super Cyclone for instance, the work is heated, quenched, and drawn on the fixture. It has been found that the Super Cyclone handles anywhere from *three to ten times as much work per hour* per unit of floor space as compared with conventional furnaces. Typical of this is the experience of a large midwestern appliance manufacturer in whose plant 8-Box Type Furnaces were used for annealing grey iron castings as shown in the picture at left. These required an area 36' long x 9' wide. One Super Cyclone requiring a space 6' x 9' long turned out as much work in eight hours as all 8 of the Box Furnaces had previously done in 16 hours. *Thus, one Super Cyclone, using but 1/6th the floor area, actually doubled the production of the 8-older furnaces, or to put it another way: Super Cyclone production was 12-times greater per unit of floor space than that of the older equipment.*



Super Cyclone at left anneals twice as many grey iron castings as eight furnaces shown above. Occupies 1/6th the floor area.

SOME FIGURES TO USE FOR COMPARISON

A large Wisconsin foundry reports the following production results from their 60" diameter x 48" deep Super Cyclone Installation:

HARDENING: Loads for hardening average 2400 lbs.
Heating time averages 1-hour 45 minutes. (Hardening temperature 1600° F. Maximum metal cross section of hardened parts 1¼")
12-loads handled per day for average daily production of 28,800 lbs. work . . . over 14 tons.
Brinell hardness held within 207 to 241.

NORMALIZING: (using same furnace as above.)
Loads vary between 4500 and 6000 lbs.
Typical load is 5000 lbs.
Time to come to heat averages 2-hour 15-minutes
(Heating cycle: heat to 1520°, hold 1-hr. air cool.)
7-heats handled per day average for production of 35,000 lbs. or 17½ tons.

STANDARD SIZES IN WHICH THE SUPER CYCLONE IS AVAILABLE

Delivery time is speeded considerably when standard size furnaces are selected, rather than special sizes which must be drawn up. Drawings are available for the following sizes of Super Cyclones all of which have been built and are in operation. Most are gas fired, although a number are available electrically heated.

CHAMBER SIZE	CHAMBER SIZE	CHAMBER SIZE
16" diameter x 20" deep	28" diameter x 28" deep	38" diameter x 60" deep
22" diameter x 26" deep	28" diameter x 48" deep	43" diameter x 48" deep
22" diameter x 36" deep	28" diameter x 60" deep	48" diameter x 72" deep
25" diameter x 20" deep	33" diameter x 36" deep	60" diameter x 36" deep
25" diameter x 30" deep	33" diameter x 48" deep	60" diameter x 48" deep
25" diameter x 48" deep	38" diameter x 36" deep	60" diameter x 72" deep
	38" diameter x 48" deep	

100 SUPER-CYCLONE INSTALLATIONS ALREADY IN SERVICE

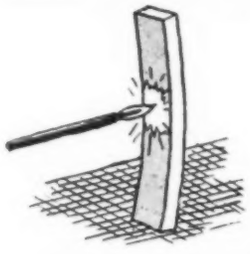
IMPORTANT NOTE: Like all other Lindberg developments, the Super-Cyclone has been thoroughly proved under 24-hour a day production conditions for a minimum of 12-months before announcement to the trade. Every effort has been made to restrict the sale of these units until the probationary period was completed. In spite of this, however, many of those who have seen the furnace in operation during the past 18-months have quickly been aware of its production possibilities and requested that units be constructed for them. Thus, over 100-Super Cyclone installations are in service from coast to coast. One or more of these is near you, as is a Lindberg District Office, staffed by practical and competent sales engineers. The Super-Cyclone is *not* a cure all, nor do we represent it as such. It is speeding production, turning out straighter work, and cutting costs for many firms however, and we will be glad to survey its possibilities for you, on your work, at your request.

Typical of the loads handled in Super-Cyclones is this 4200 lb. load of 3" rounds — heated and quenched in less than ⅓rd time required in box furnaces.

LINDBERG FURNACES

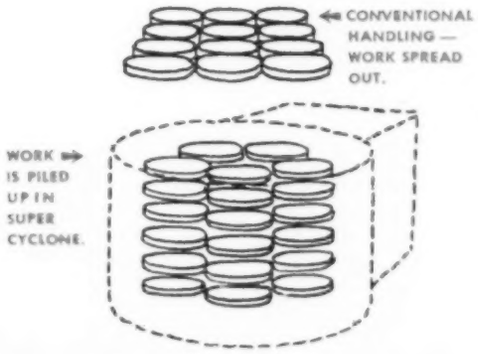
LINDBERG ENGINEERING COMPANY
2453 WEST HUBBARD STREET CHICAGO

WHAT WILL THE SUPER CYCLONE DO FOR YOU? USE THESE QUICK CHECKS TO FIND OUT



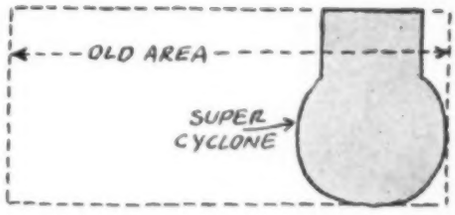
ELIMINATES ONE SIDED HEAT . . . KEEPS WORK STRAIGHT

Prove to yourself how one-sided heat causes distortion. Take a flat bar and heat it on one side with a torch. Notice how it bows. This is what happens when radiation heat strikes only one part of your work in the furnace. Contrast this with the Super-Cyclone in which forced convection is the only heating method. Heat floods through every part of the charge under pressure, and at high velocities. Radiation from a source hotter than the desired temperature is *completely absent*. As a result your work is not strained or pulled out of shape by one-sided heat. The result is that straightening is either completely eliminated—or reduced to a fraction of what is required when work is handled in conventional equipment. When your work goes into the Super Cyclone straight it stays straight . . . cuts straightening costs . . . speeds production.



HEAVY LOADS ACCURATELY HEATED . . . PRODUCTION SPEEDED

You can easily verify the production increases possible through Super Cyclone Heating. Just spread an average 3000 lb. load of your parts on the floor one layer thick as handled in a radiation heated furnace. Measure the area required. Then take those same parts and *pile them up* in a 36" or 48" circle, making allowance for spacers or supports. Figure it will take you a *maximum* of 3-hours to heat the piled up parts on a fixture. Five minutes to quench the lot. Ordinarily you will find production increase of from 200 to 1000% possible. Parts remain on fixture for quenching and tempering, a substantial saving in handling.

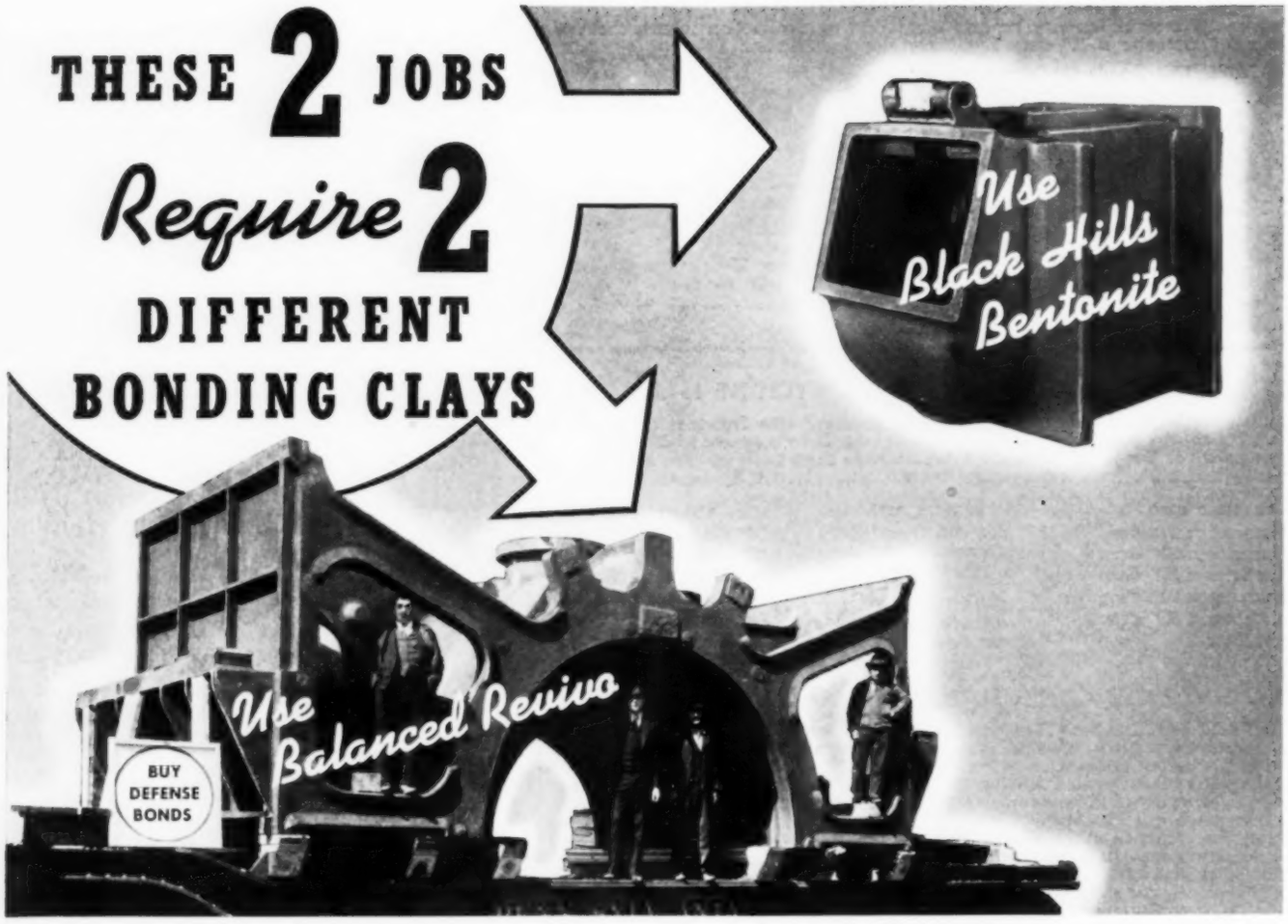


CRAMPED FOR FLOOR SPACE . . . THEN DO THIS!

Just measure the total floor space required to turn out your present production by your present methods. *As a very conservative thumb rule you can figure that the Super Cyclone will require not more than ⅓rd the floor area needed by any other type of equipment, to handle the same or greatly increased production.* The result . . . production increases of several hundred percent in present floor area . . . quick production increases without having to move or expand heat treat department area.

These thumb-rules are, of course, general and may not fit all cases. They are averages of what the Super-Cyclone has done in many plants. A Lindberg Representative can quickly and accurately give you any production figures, floor space layouts, or other information you may need.

THESE 2 JOBS Require 2 DIFFERENT BONDING CLAYS



It's a clear case, Mr. Foundryman. You have here two different jobs and a consequent need for two different bonding clays.

ECP's six service engineers don't have to "straddle" all applications with one bonding clay, be it right or wrong. Having five different products and many combinations to draw upon, they are "foot loose" to recommend the *one correct bonding clay* for your purpose.

For that great big iron casting you want Balanced Revivo to develop extremely high dry and hot strength, plus its thermoplastic properties to prevent cuts and scabs.

For the steel journal box the answer is Black Hills Bentonite to obtain high green, dry and hot strength. It is just such impartial advice, stemming from an average of 14 years' practical experience per service man, that assures you of *better molds, better castings, less scrap and most bond strength per dollar.*

* * *

At your command—still another service man. The ECP service staff, totalling about 9000 calls per year, *knows* foundry conditions at first hand.

EASTERN CLAY PRODUCTS, INC., EIFORT, OHIO

DIRECT SALES OFFICES: *Detroit*—510 United Artists Building; *Buffalo*—228 Highgate Avenue; *Philadelphia*—6483 Morris Park Road; *New England Office*—33 Bass Street, Wollaston, Mass. AGENTS: Milwaukee—Walter Gerlinger, Inc.; Chicago—Western Materials Co.; Chattanooga—Porter Warner; Los Angeles—H. C. Donaldson & Co.; San Francisco—H. C. Donaldson & Co.; Montreal—Webster & Sons, Limited; Minneapolis—E. R. Frost & Co.; London—District Chemical Co., Ltd.

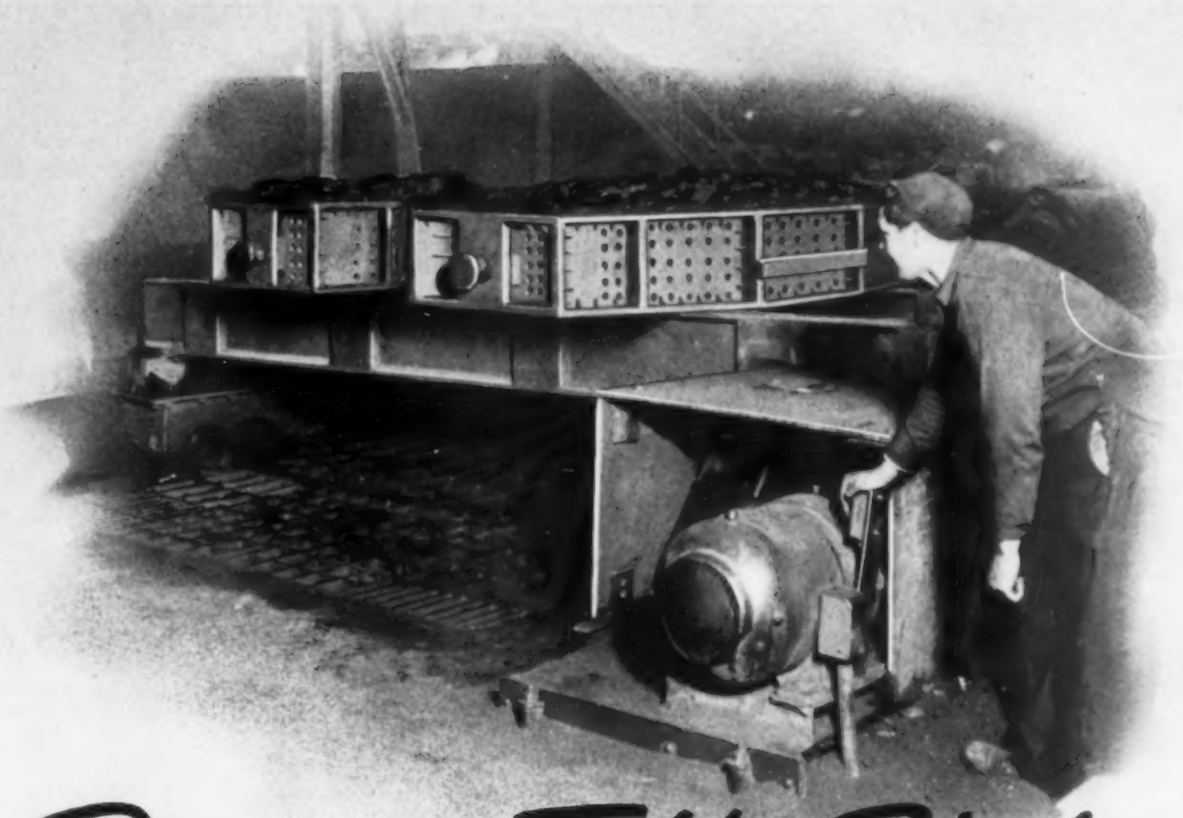
Authorized to license foundries under Hanley patent 1657573

ECP

DIXIE BOND • BLACK HILLS BENTONITE • REVIVO BOND • REVIVO SUPER BOND • BALANCED REVIVO

All TYPES OF BONDING CLAYS

A Foundry Sand Service Based Upon Practical Research



Bumping Table Shakeouts
in sizes for practically any flask

• The Bumping Table Shakeout—a typical installation of which in a large steel foundry shaking out two 5000 pound 10-foot flasks is shown above—is an exceedingly efficient unit, and can be furnished in different sizes, including those suited for handling medium and quite small flasks.

The tables of these units are mounted over collecting hoppers. One end of the table is hinged to a rigid support—the other end rests on revolving cams which are motor driven at a speed that produces a thorough bumping effect.

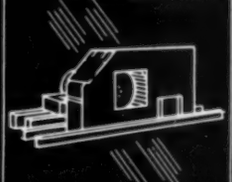
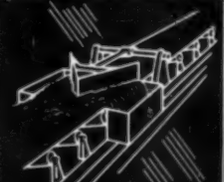
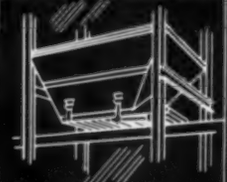
In addition to bumping table shakeouts, we are in a position to furnish shakeouts consisting of a perforated plate or heavy wire mesh screen mounted on a vibrating frame, vibrating bail and other special types of shakeouts, air operated mold pushers and pullers that simplify the moving of heavy flasks from mold conveyors to shakeouts, and shakeout dust collecting hoods and duct work in the design and manufacture of which Bartlett-Snow engineers have had long experience.

Our recently issued 40-page Foundry Bulletin No. 91 illustrates many different Shakeouts and other Bartlett-Snow Foundry Equipment—Copies of this book are available on request.

THE C. O. BARTLETT & SNOW COMPANY
6201 Harvard Avenue **Cleveland, Ohio**
Engineering and Sales Representatives in the Principal Cities

BARTLETT-SNOW
ENGINEERS AND FABRICATORS FOR THE FOUNDRY INDUSTRY

Complete Sand, Mold and Castings Handling Equipment for any requirement, including

Shakeouts	Elevators	Aerators	Sand Distributors	Bins and Feeders	Apron Conveyors	Dust Collectors
						

MACKLIN
GRINDING WHEELS

Macklin Wheels Are Uniform

Uniform grinding wheels, after most rigid control of previous operations must be carefully and skillfully finished to exact micrometer limits on the face, sides and arbor hole. Special new and modern lathes operated by experienced craftsmen insure uniformity of size in each and every high quality MACKLIN grinding wheel. Protect Your Production with grinding wheels that are always uniform.

Ask for Macklin Engineering Service.

MACKLIN COMPANY

Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.

Distributors in all principal cities

Sales Offices: — Chicago - New York - Detroit - Pittsburgh - Cleveland - Cincinnati - Milwaukee - Philadelphia

IMPORTANT ANNOUNCEMENT TO THE FOUNDRY INDUSTRY:

Tripoli Parting

Its Use Approved by the Various Compensation Insurance Rating Authorities

● If you are a user of parting, please note that you can now use genuine Tripoli Parting. Effective December 31, 1940, the National Council on Compensation Insurance amended the Occupational Disease Schedule Rating Plan, approving the use of Tripoli *from the deposits of the Seneca, Mo. area.* Most states have followed their ruling.

Tripoli Parting Unexcelled in the Foundry Now Available to Aid Production

Over the years, it has been indicated that pure, unadulterated Tripoli (found only in the Seneca, Missouri area) makes the most satisfactory and dependable parting. Its many advantages are well known to foundrymen. Tripoli's moisture and heat-resisting properties are unequalled. A little goes a long way—a light dusting is sufficient for difficult, deep lifts, and smooth, clean-surfaced castings result. Light in weight, Tripoli Parting is definitely more economical, less expensive.

Buy Genuine Tripoli Parting from Leading Foundry Supply Houses

Leading supply houses can furnish you with genuine, high grade Tripoli Parting made from the original Barnsdall "Seneca Standard" Tripoli. For certain satisfaction and your own protection, be sure to get parting made from Barnsdall "Seneca Standard" Tripoli.

SENECA STANDARD

Genuine, Highest Quality Tripoli from Seneca Deposits Processed by

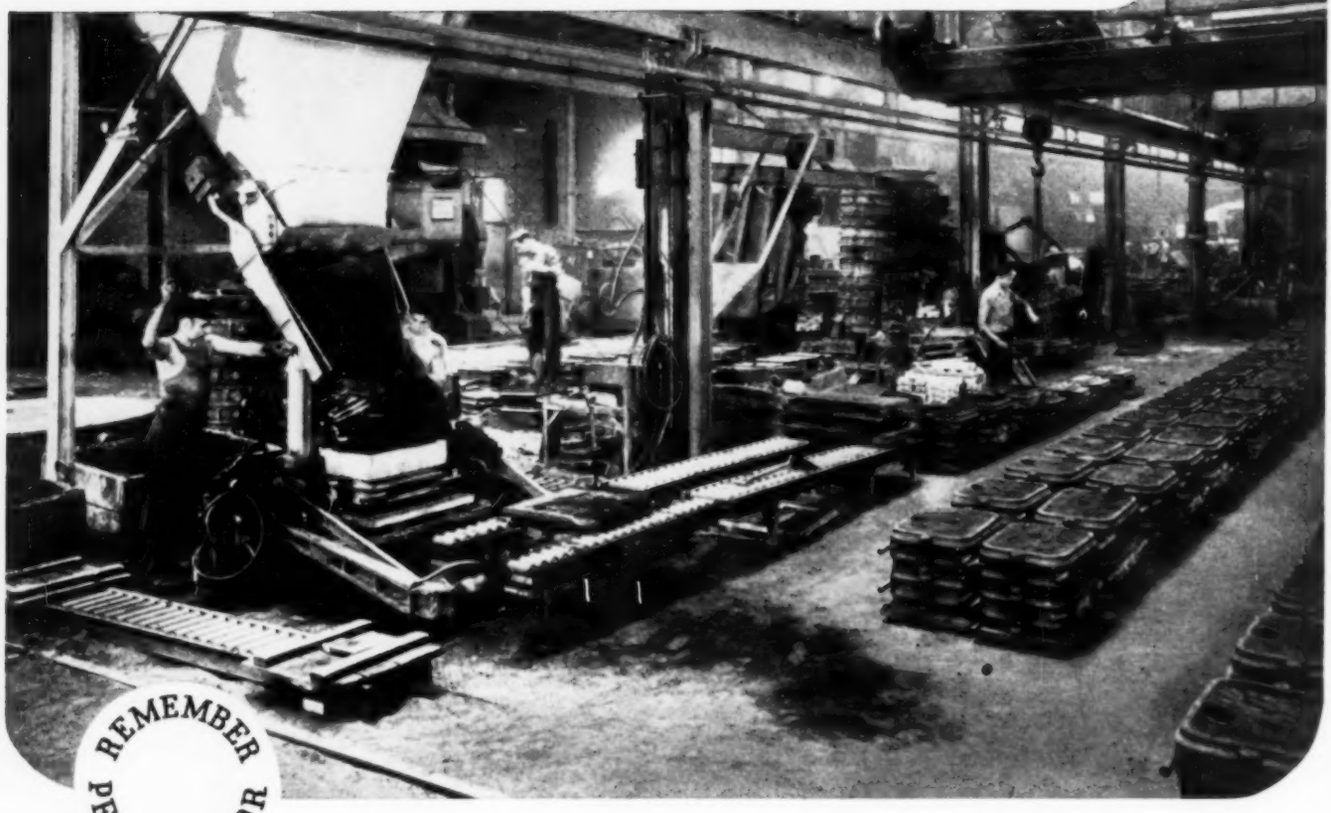
BARNSDALL TRIPOLI CORPORATION

(FORMER NAME—AMERICAN TRIPOLI COMPANY)

SENECA, MISSOURI

SUBSIDIARY OF BARNSDALL OIL COMPANY

STEP ON IT!

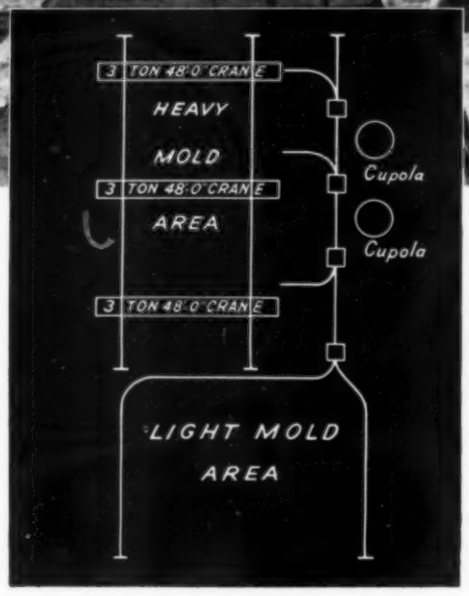


Now more than ever foundrymen throughout the nation must do their part to help the war effort. You will have to "Step On It!" to help. Time is the essence of VICTORY.

Herman Molding Machines can help you successfully play your part. Increased mold production as high as five hundred per cent has been achieved in some foundries. Now is the time for you to analyze your mold production set-up. Our experienced engineers will be glad to show how Hermans can help you. No obligation.

MOLDING HERMAN MACHINES

HERMAN PNEUMATIC MACHINE CO., UNION BANK BUILDING, PITTSBURGH, PA.



FOUNDRY SYSTEM SPEEDS PRODUCTION . . . and PAYS for itself

A careful check of all costs revealed that the entire Cleveland Tramrail materials handling system in the foundry shown above paid for itself in less than one year.

Because the equipment speeded production and improved plant efficiency, costs were lowered considerably. The savings thus effected more than paid for the system the first year.

The equipment is of the hand-propelled type and includes three 48-foot cranes, a 200-foot runway and other trackage, switches, hoists and carriers.

The cranes serve the heavy mold area. Hot metal is conveyed directly from cupolas to molds in this section. In the light mold area the metal is transported on the overhead rail system and transferred into hand pouring ladles for distribution.

Hundreds of foundries are speeding production and profiting from installations of Cleveland Tramrail.

GET THIS BOOK!

OOKLET No. 2008 . . Packed with valuable
formation. Profusely illustrated. Write
a free copy on your company letterhead.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1155 EAST 283rd ST. WICKLIFFE, OHIO.

MANUFACTURERS OF • CLEVELAND CRANES • CLEVELAND TRAMRAIL • STEELWELD BENDING PRESSES

CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT

You Can't Afford to

Here's How G-E X-Ray Can Help Insure It

If you manufacture munitions or materials vital to defense and victory, and you require x-ray in your inspection facilities, G. E. offers you this sound advice: *Depend on G-E Industrial X-Ray Engineers, Equipment, and Service to save valuable time and to insure quality.*

G-E INDUSTRIAL X-RAY ENGINEERS. First to apply x-ray to industrial inspection—more than 20 years ago—they have an intimate knowledge of modern manufacturing methods. Through them G.E. offers every defense industry the cumulative benefits of its long, varied industrial x-ray experience.

Their recommendations will include data on the voltage range and duty necessary to insure that inspection will keep up with production. There'll be no guess work about technique or the type of mounting required to do your job. There'll be no need for time-consuming experiments because G-E recommendations are based on 20 years of x-ray engineering "know how." G-E X-Ray Engineers will save your time because they will give you reliable facts and figures to help you select the G-E X-Ray Unit best suited to your particular problem.

G-E INDUSTRIAL X-RAY UNITS. Years ago G-E X-Ray Engineers recognized that x ray equipment designed for vastly different types of applications could not be satisfactorily adapted to industrial work. Thus came their logical development of a series of specialized x-ray units having transformers, tubes, controls, and mountings all designed expressly for industrial service.

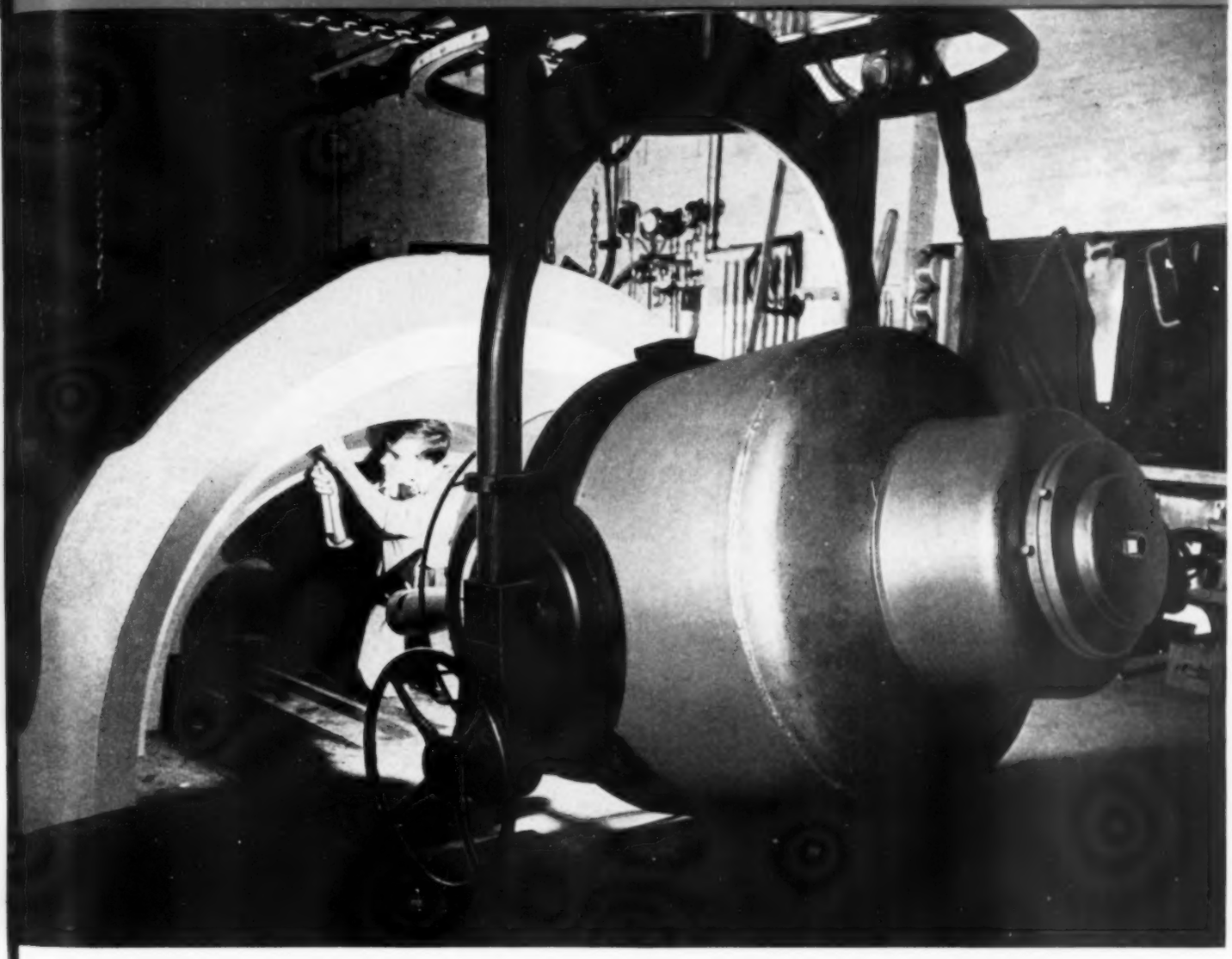
Today, there is a complete line of shockproof, climate-proof G-E Industrial X-Ray Units with a full range of power of up to and including one-million volts. Unlike ordinary x-ray apparatus, they are plus-powered to provide fast, accurate x-ray service. They'll take heavy duty cycles in their stride with day-in-and-day-out dependability. Their full flexibility saves priceless operating time; simplicity of operation is assured because all electrical controls are centered in one compact panel.

G-E INDUSTRIAL X-RAY SERVICE is provided by more than 53 direct factory branch offices and regional service depots. Staffed with factory-trained field engineers and servicemen, these strategically located offices are equipped to render fast, efficient service. They minimize long, costly delays, and they eliminate the possibility of damage to your equipment which would result if you left it in the hands of unskilled men for adjustment.

TO GET THE FULL STORY about G-E Industrial X-Ray Units, to save yourself time, and to insure high quality x-ray service for your plant, call in a G-E Industrial X-Ray Engineer. He will have all the answers to your questions; to request his services, write or wire, today. Address Department R33. General Electric X-Ray Corporation, 2012 Jackson Boulevard, Chicago, Illinois.

GENERAL ELECTRIC

Gamble With Quality

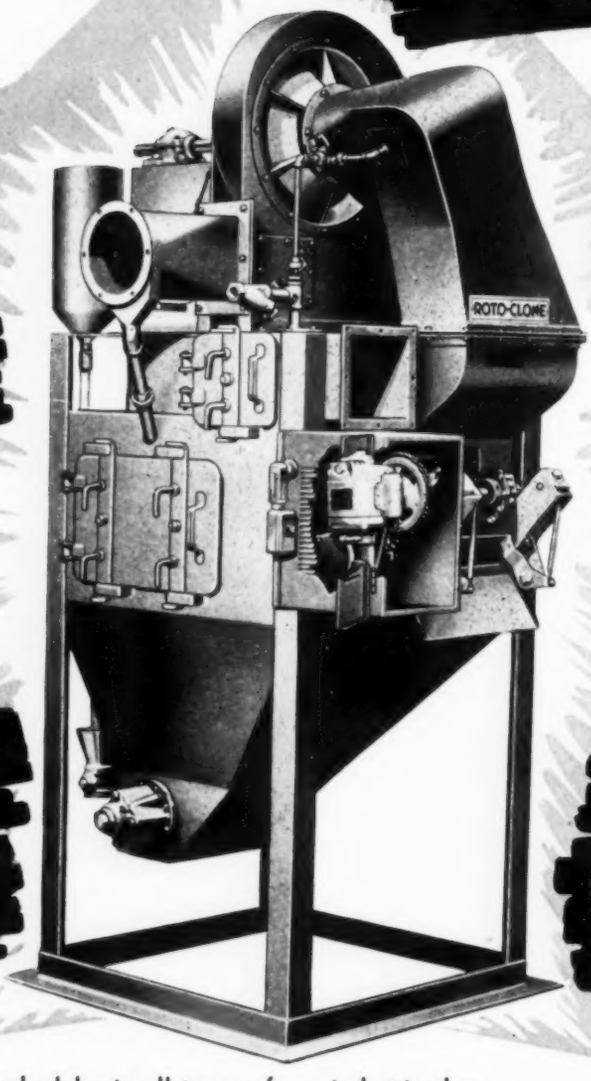


MILLION-VOLT "CANDID CAMERA" • • • this powerful, compact, shockproof G-E 1000-Kv. Industrial X-Ray Unit speeds vital defense productions. It will take radiographs through various metal thicknesses—from one inch on up—in seconds and minutes as compared with the hours and days formerly required to do the same job. Like all G-E Industrial X-Ray Units, it is mounted to provide unusual flexibility of application.

Films, Film-Processing Chemicals, Screens, Cassettes, and other accessories to make G-E's the world's most complete single-source x-ray supply line—available from 35 direct factory branch offices.

X-RAY CORPORATION

Why ROTO-CLONE SPEEDS PRODUCTION SCHEDULES



Roto-Clone provides highest efficiency in dust removal over a wider range of particle sizes.

Roto-Clone requires a minimum of space — is a complete unit and requires no auxiliary equipment.

Roto-Clone delivers collected dust as sludge —eliminating secondary dust problems.

Roto-Clone guarantees constant performance at peak efficiency without interruptions for reconditioning or servicing.

Roto-Clone exhausts constant air volumes regardless of dust concentration or presence of steam and fumes.

★ Vastly accelerated delivery schedules in all types of war industries have brought dust collection problems to the forefront in production planning. As a result, 3 times as many Roto-Clones were bought in 1941 as were sold in 1940, and the sales-curve goes still higher in 1942. Better than 95% of these have been installed in war production industries.
If you have a process dust problem write for Roto-Clone Bulletins which will be sent without obligation.

AMERICAN AIR FILTER CO., INC.
Incorporated
265 Central Ave., Louisville, Ky.
IN CANADA: DARLING BROS., LTD., MONTREAL, P. Q.

ROTO-CLONE
WATER SPRAY
DYNAMIC PRECIPITATOR

FOR FOUNDRY AAF DUST CONTROL

High Speed JOLT ROLLOVER

Here's a compact, high-speed molding machine, engineered to meet present demands for peak production. It's a modification of the famous Milwaukee Jolt Squeeze Rollover Draw which has been outstandingly successful — actually producing 70 to 80 molds per hour on production lines for the past two years. The modification is only the elimination of the squeezing mechanism. Therefore all of the other fast operating features are retained to make the present machine ideal for general molding and core making.

Investigate the tremendous possibilities of this machine for application to a wide range of work.

Check these Features

- Clamping is automatic
- Rollover operation performed by simple, quick-acting pistons
- Roll back cushioned by same pistons
- Hydraulic levelling is instantaneous
- Finished mold or core deposited on conveyor for ready removal
- Absolute minimum number of parts results in lowest maintenance cost
- No obstructions on any side of machine above flask line
- Compact design — minimum floor space required

MILWAUKEE FOUNDRY EQUIPMENT CO.

3238 WEST PIERCE STREET • Cable Address "MILMOLDCO" • MILWAUKEE, WISCONSIN

Do you want TONNAGE?

THE CLEARFIELD

is the ideal source of dependable sand *in quantity* in the mechanized production shop.

"Ready made" for any layout plan, a compact "one level" unit with the simplest possible drive, it may be placed on the floor as in this picture, or set on structural steel over conveyor or prepared sand storage bins.

●

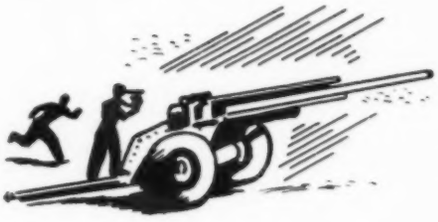
This is a CLEARFIELD 930 in a big midwestern iron foundry. Mulling time per charge: one minute. See the stream of sand going up the conveyor. That's production!

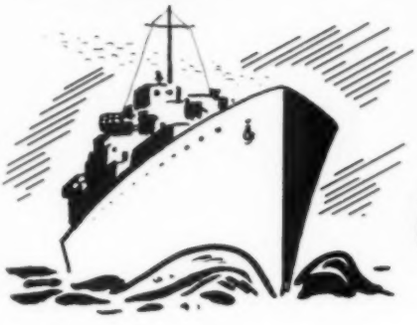
If you have a BIG job,—gray iron, steel, magnesium, whatever it may be,—let us show you how easily, efficiently, and smoothly our equipment will serve you.

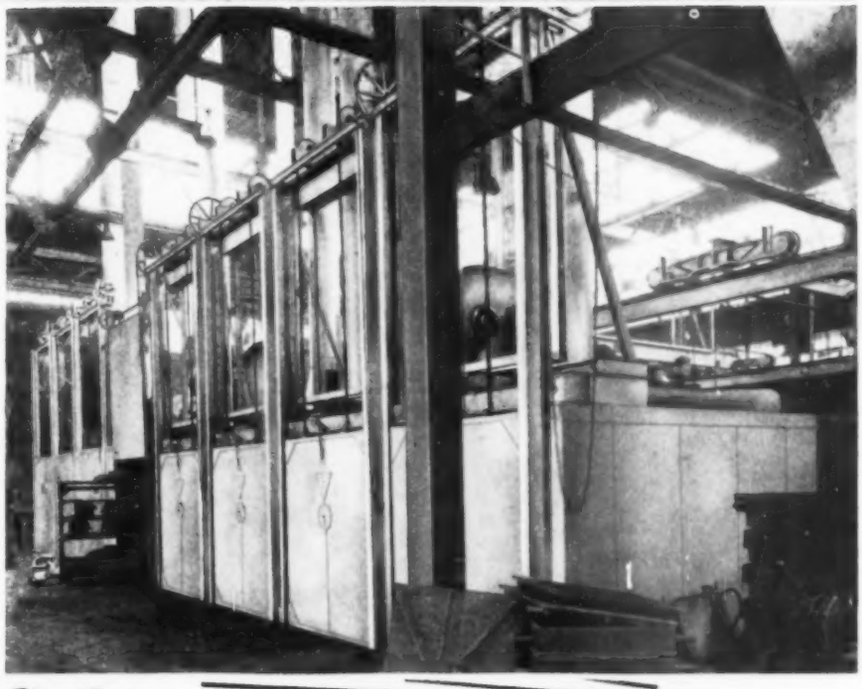
CLEARFIELD MACHINE COMPANY

CLEARFIELD PENNSYLVANIA, U. S. A.

SOS - DESPATCH CORE AND MOLD OVENS NEEDED SOS — AT ONCE!







OK — SPEEDY DELIVERY ASSURED — TELEPHONE REQUIREMENTS

Records are being established by Despatch for quick response to all S O S signals. Despatch Core and Mold Ovens can be made fast. Special machinery and facilities speed up construction of Despatch NON-THRU metal panels, heaters, and duct work. The increase of Despatch facilities and personnel plus the excellent cooperation from all sources of supply are important reasons why Despatch Foundry Ovens are up and operating for war production in record time.

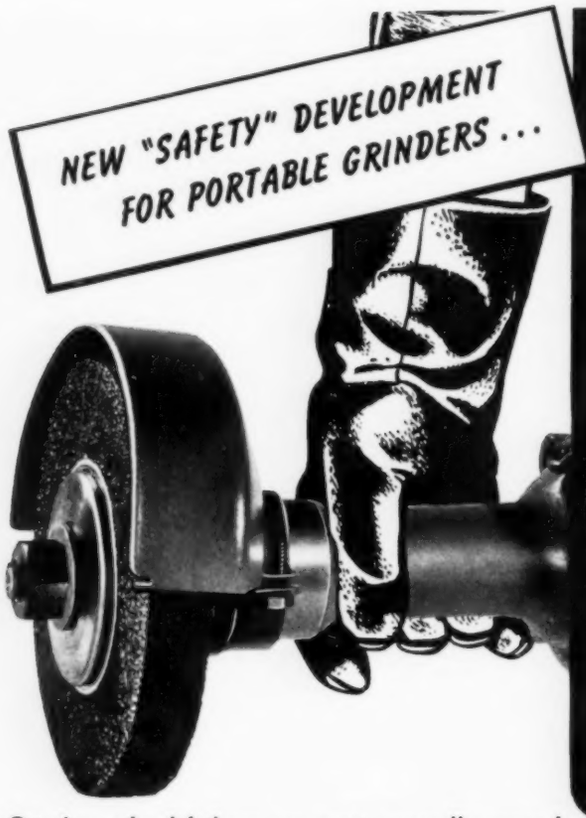
Despatch Horizontal Flow system — assures uniform treatment to every core in the load. Despatch Air Heaters (gas-oil) supply ample heat for greater processing speed—with better core quality. These and other Despatch features provide the means for boosting core production and reducing the cost per ton handled.

★ War time production methods call for unprecedented use of castings from ferrous and non-ferrous metals and alloys. These requirements demand uniform baking to provide the best core quality possible as well as great production speed. Do not experiment now! Use tested ovens. Despatch ovens have been accepted as standard equipment by leading foundries.

REQUEST YOUR COPY *of special Foundry Bulletin No. 31. Timely - Informative - Write Today*

DESPATCH
OVEN COMPANY MINNEAPOLIS, MINNESOTA

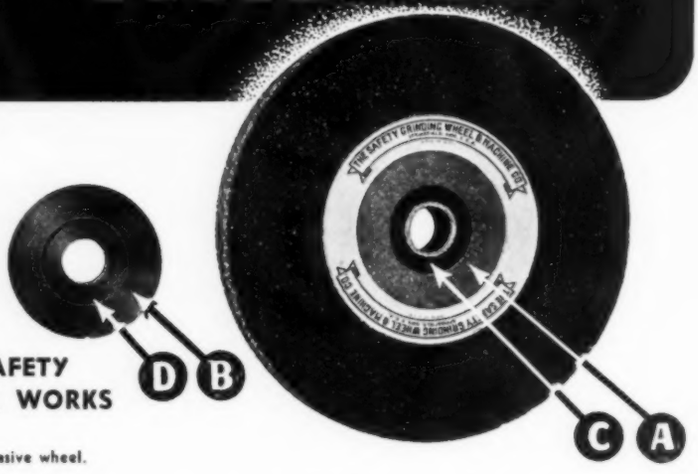
NEW "SAFETY" DEVELOPMENT FOR PORTABLE GRINDERS . . .

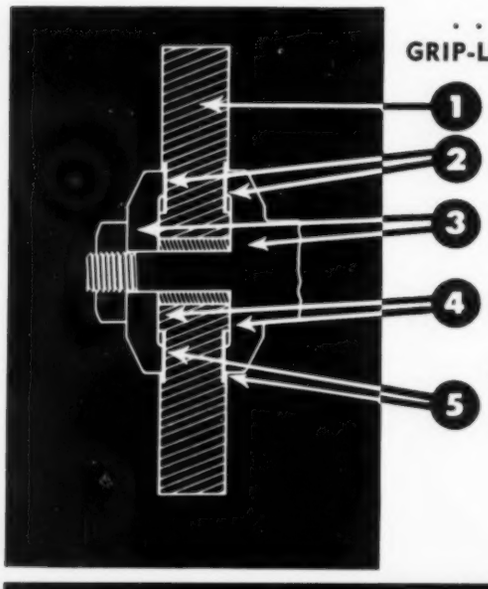


"SAFETY" GRIP-LOK GRINDING WHEELS

Grinding wheel failures are most generally caused by one of the following: 1—Injury during shipment, 2—Incorrect mounting of the wheel, 3—Accidental injury during operation.

Insure against injuries, property damage and costly time delays by insisting on the portable grinding wheel which prevents a broken wheel from flying apart . . . the new SAFETY GRIP-LOK GRINDING WHEEL.





. . . HOW SAFETY GRIP-LOK WHEEL WORKS

1. Represents the abrasive wheel.
2. Safety Grip-Lok Wheel has annular recesses on both sides concentric with arbor hole.
3. Standard flange same as provided on all portable grinders.
4. Relief in flanges. When wheel is mounted and tightened flanges 3 enter recesses 2 and overhang ends of abrasive hub.
5. Resilient composition washer is located in recess 2 on both sides of wheel. When pressure is brought on washer, flanges 3 enter recesses 2 by compressing the washers.

When the flanges ("B" in photograph of collar above) compress the composition rubber and cork washer in the recess ("A" in photograph of wheel above) they allow the raised hub, "C", to come up under the recess of the flanges, "D", and act to prevent segments of a broken wheel from flying outwardly.

We can promptly supply "SAFETY" GRIP-LOK WHEELS in all grains and grades. For the phone number of the "Safety" Sales Office or Warehouse nearest you, consult the list below.

"REMEMBER PEARL HARBOR"

SAFETY

Established 1891

THE SAFETY GRINDING WHEEL & MACHINE CO.

Main Office and Factory SPRINGFIELD, OHIO, Phone 4651

• SALES OFFICE ★ SALES OFFICE and WAREHOUSE

• Birmingham—3-3323 ★ Chicago—Brunswick 2000 ★ Cleveland—Cedar 9292 ★ Detroit—Trinity 1-5420
★ Erie—25-687 • Houston—Preston 2381 ★ Philadelphia—Rittenhouse 6095 ★ Pittsburgh—Court 2822
• St. Paul—Nestor 7279 ★ St. Louis—Central 3787 ★ Syracuse—2-1377

Avoid MAGNESIUM DUST FIRES

This Mahon Hydro-Foam Dust Collector is available in either Single or Double Bench models for the accommodation of one or more operators.

With THE MAHON HYDRO-FOAM DUST COLLECTOR

If you grind—buff—or polish—magnesium alloy castings in your plant you have one of the greatest potential fire and explosion hazards known. Magnesium dust can ignite from the smallest spark—with mighty disastrous results. Dust collecting systems, that convey the dust through ducts to a distant point, provide little or no protection. *Magnesium dust should be immersed in water—immediately.* That is exactly what the Mahon Hydro-Foam Dust collector, pictured above, accomplishes. In one compact Unit there is embodied a hooded, ventilated work bench combined with a mechanism for depositing this dangerous dust *under water.* Operation is remarkably simple. Merely start the exhaust fan (the only moving part) and all dust, chips and shavings are instantly drawn through a wooden grillage set in the bench and completely submerged in a tank of water directly below. The Unit is portable and may be set up anywhere that water, sewer and electrical connections can be made. You will surely want to know about this latest development of Mahon engineers that is so essential to safety wherever magnesium alloy castings are processed. Write for complete particulars—at once.

THE R. C. MAHON COMPANY • DETROIT • CHICAGO

Speed Up War Production — Save Days and Dollars with this Special Mahon Industrial Equipment

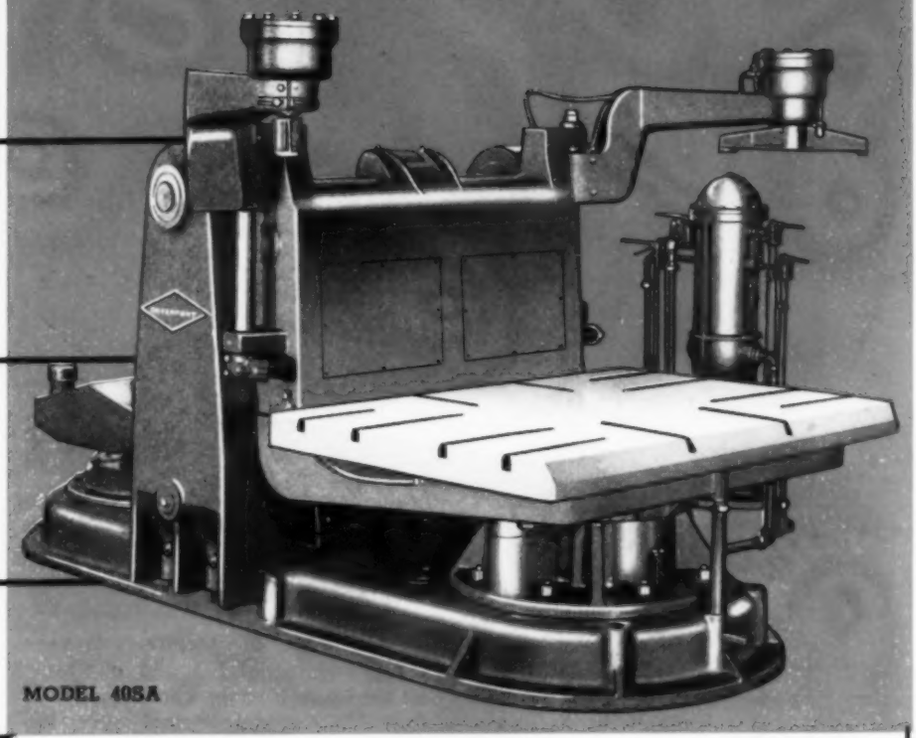
Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Foam Dust Collectors—and Many Other Units of Special Production Equipment—including Complete Finishing Systems.

MAHON

★ ★ ★

MODERN "DAVENPORT" MOLDING MACHINES

Make Castings Faster and Better



MODEL 405A

"DAVENPORT" LINE OF MOLDING MACHINES

★JOLT ROLLOVER DRAW MACHINE
Model SA (Seven sizes)
Capacity from 750 to 12,000 lbs.
Model A (Six sizes)
Capacity from 1,000 to 12,000 lbs.

★JOLT STRIPPER OR PUSH-OFF MACHINES WITH ADJUSTABLE LIFT PINS
Six sizes
Capacity from 1,000 to 10,000 lbs.

★PLAIN JOLT MACHINES
Fourteen sizes
Capacity from 200 to 25,000 lbs.

BOMBERS - TANKS and JEEPS

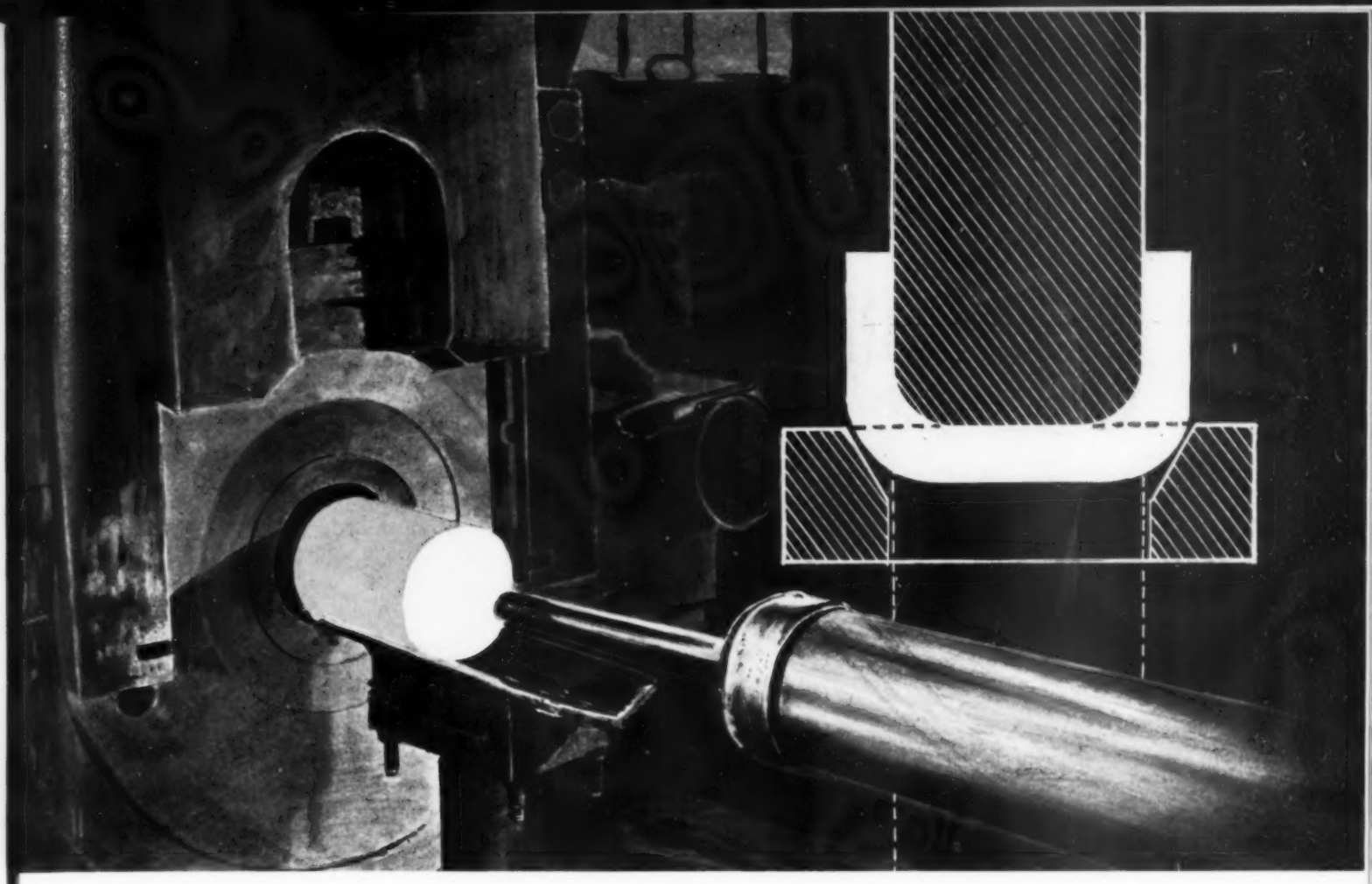
In the foundries of America you will find "DAVENPORT" Molding Machines serving our country in making parts of Bombers, Tanks, Jeeps and many other vital parts to speed up WAR production.

The New Modern "DAVENPORT" Molding Machines are delivering increased production—they are making new records—they are making better castings!

"DAVENPORT" Molding Machines are stepping up production, lowering costs and paying for themselves in short order under present-day requirements.

Send for our new literature on the "DAVENPORT" Line of Foundry Molding Machines—or better, let us have one of our engineers come to your plant and discuss with you the possibility of increasing your present capacity.

DAVENPORT MACHINE & FOUNDRY CO.
DAVENPORT, IOWA, U. S. A.



For Hot Working Dies—

In cast iron dies for swaging and pressing operations at elevated temperatures, there are three major requirements: Wear Resistance; Resistance to Scale Adherence; Resistance to Heat Checking.

Scale adherence and excessive heat checking both require refinishing of the die. In the case of excessive heat checking, more stock must be removed in subsequent machining than is required when only normal wear is involved.

In unalloyed cast iron, sufficient wear resistance can only be obtained with low carbon, and such iron is inherently prone to heat checking and scale adherence. If high carbon iron is used to avoid heat checking, scale adherence is likely to be increased due to metal porosity, and poor wear resistance is bound to occur unless proper alloys are used.

Total Carbon	3.70-3.95%
Silicon	1.10-1.50%
Molybdenum	0.70-1.10%
Vanadium	0.15-0.25%
Chromium	0.00-0.40%

The ideal iron for these applications would therefore contain high carbon to avoid heat checking; density and high carbon to avoid scale adherence; and hardness and strength at elevated temperatures to avoid wear. The most successful irons for this application are alloy irons within the range of composition shown herewith. The best analysis for the specific iron depends upon section size and type of application.

These irons may be controlled from 200 to 300 Brinell hardness with tensile strength of over 40,000 pounds per square inch, if desired. Sections from 1½ to 7 inches have been controlled successfully with the use of external chills. The unusual combination of alloys permits good machinability in all ranges of hardness together with maximum life under conditions of severe service. In lighter sections, or for maximum hardness, V-5 Alloy is used to control chill depth on sharp corners.

PARADIUM

CORPORATION OF AMERICA · NEW YORK, N. Y.

FERRO-ALLOYS

WHICH WOULD YOU *Rather Have* FOR THE SAME PRICE . . .

ANY NUMBER OF SECOND HAND VIBRATORS *or* 1 *New One?*

Which would you rather have—$15 worth of used vibrators or a new one for the same amount?

Any way you figure it, second-hand vibrators are a gamble—and a mighty poor one at that. You *may* get considerable service out of them, but you probably won't. *If you do,* it's a 100-to-one shot the cost of repairing them will more than offset the value you extract from them. *If you don't,* you're all the deeper in the hole, and that's a great deal worse.

That has always been true. It's all the more true today when good maintenance men receive around $10 a day and are increasingly hard to find. And even if skilful rebuilding of vibrators *did* turn out well, your maintenance men still could spend their time far more profitably otherwise than in such work.

So, if there ever was a case for reconditioning broken-down vibrators, there isn't any more. Especially when you can still buy SPO's, with important features which enable us to guarantee them to give you all the service you expect . . . *Don't allow your production to bog down. Have plenty of new SPO vibrators in stock.*

SPO

INCORPORATED

Manufacturers and Specialists in Molding Machines, Vibrators and Patterns for Production

7500 GRAND DIVISION AVENUE • • CLEVELAND, OHIO

"CHIEF, IT LOOKS AS THOUGH WE WON'T BE ABLE TO GET THAT NEW EQUIPMENT"
"THEN LET'S PLAN FOR MORE STAYNEW FILTERS TO KEEP OUR PRESENT EQUIPMENT AT PEAK EFFICIENCY"

Check Your Needs Now FOR STAYNEW FILTERS

Not only are many suppliers unable to deliver new equipment, but nowadays competent repair service is often unavailable. Present equipment *must* be made to last! One of the best ways to assure its continuous, repair-free operation is to protect it with Staynew Filters. Staynew builds filters for compressor and engine protection, pipe lines, building ventilation, air, gas, and liquids. Sizes and types are made for nearly every requirement. If necessary, Staynew engineers will adapt present models or design new ones for your special needs. *"Keep 'Em New"* with *Staynew Filters.*

WRITE FOR CATALOG today, and find out how your equipment can be made to last longer and operate more efficiently when Staynew-Filter-protected.

COMPRESSOR INTAKE

Model D

Air drawn into intakes of compressors, Diesels and other internal combustion engines must be clean. Dust scores cylinder walls, clogs valves, causes excessive carbon formation, wears all reciprocating and rotating parts. Model D Filters, featuring famous Radial Fin Construction prevent dust intake at 99.8% efficiency as rated by U. of Calif. tests, yet show level resistance curves at a peak of only 1" W.G. after 12 mos. use. Silencer models available.

PIPE LINE

Model CPHS

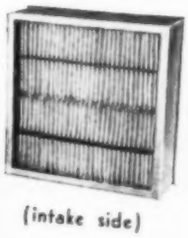
Dust, dirt, pipe scale and other foreign matter may cause damage to air-powered foundry tools. Moisture carried into blast barrels from air lines may cause corrosion of shot with consequent clogging and packing. Staynew pipe line filters deliver clean, dry air only. Featured Radial Fin Construction permits high filtering efficiency, low restriction to air flow.

BUILDING AND ENGINE ROOM VENTILATION

Automatic

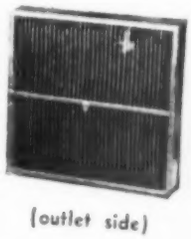
Clean air is essential to proper operation and protection of much vital equipment as well as protecting the health of employees. Motors, transformers, etc., must be supplied with dust-free air. Staynew Automatic Filters deliver large volumes of clean air at low cost. Panel Filters offer highest possible efficiency with low restrictions to air flow; Wire-Klad Filters feature low initial cost, long life and fire resistance.

Panel



(intake side)

Wire-Klad



(outlet side)

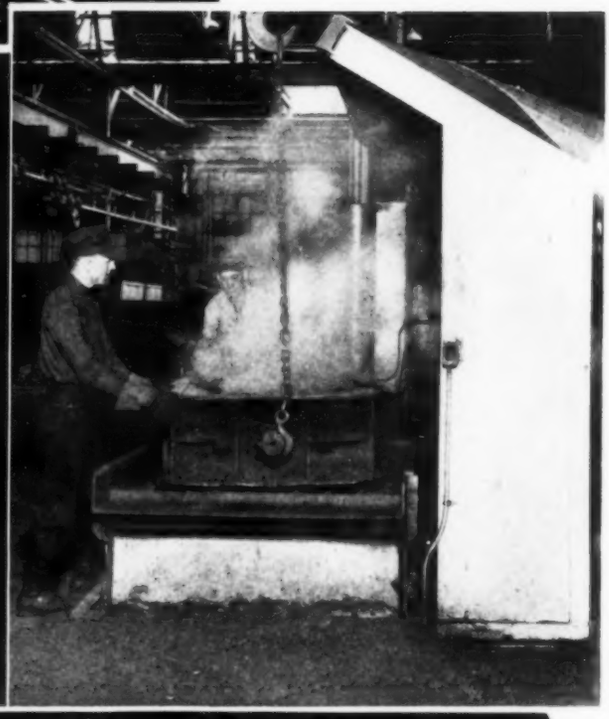
STAYNEW FILTER CORP.

"Filter Headquarters"

PROTECTOMOTOR AIR FILTERS

36 Centre Park, Rochester, N. Y.

"CRACK DOWN"



on the Shake-Out Dust Nuisance!

Defend your employees against the slow-down caused by dust and fumes. Keep your production in high by improving working conditions now. Ventilate your shake-outs with Schneible high efficiency "Uni-Flo" Dust Hoods — adjustable louvers act as a venturi, no eddy currents; smoke and fumes as well as dust effectively drawn in. Uniform velocity with minimum resistance. Many are in satisfactory operation today.

Schneible "Uni-Flo" Hoods used in conjunction with Schneible Multi-Wash Dust Collectors are an unbeatable combination for keeping foundries dust and fume free and in shape for all-out production. Men in the service and the men behind the men in the service deserve the best. Made in the Senior, Junior and Midget Types.

"Uni-Flo" Hoods are available for foundries of every size and type and for use with dust collectors of any type of c. f. m. capacity. Send for the facts!

CLAUDE B. SCHNEIBLE COMPANY

3953 Lawrence Avenue, Chicago

Offices in Principal Cities

SCHNEIBLE

WAR TIME IS NO TIME TO GAMBLE

PLAY SAFE

with Your Cleaning Room Production

By Fitting Norton Wheels o Your Snagging Jobs

ACCURATE fitting of grinding wheels to their job means more efficient grinding—faster production—more tanks, guns, ships and other armament products. And the complete line of Norton Wheels for the foundry makes accurate fitting *really possible.*

For hard, tough alloy steels there are wheels of tough Alundum abrasive while for softer steels there's the more easily fractured 15 Alundum abrasive. For gray iron, hard malleable and similar castings there is the harder but more brittle Crystolon abrasive.

For high speed snagging with its faster cutting action and better finish there are Norton resinoid and rubber bonded wheels. For use on slow speed machines, especially the severe jobs where pressures are high, there are Norton vitrified bonded wheels.

To help the grinding action and prevent metal from sticking to the cutting points on some types of jobs, several special patented lubricating treatments for Norton Wheels are available.

In your district there's a Norton engineer ready to help you take full advantage of this complete line of foundry wheels—ready to fit them scientifically to your cleaning room jobs for the maximum production now so vital.

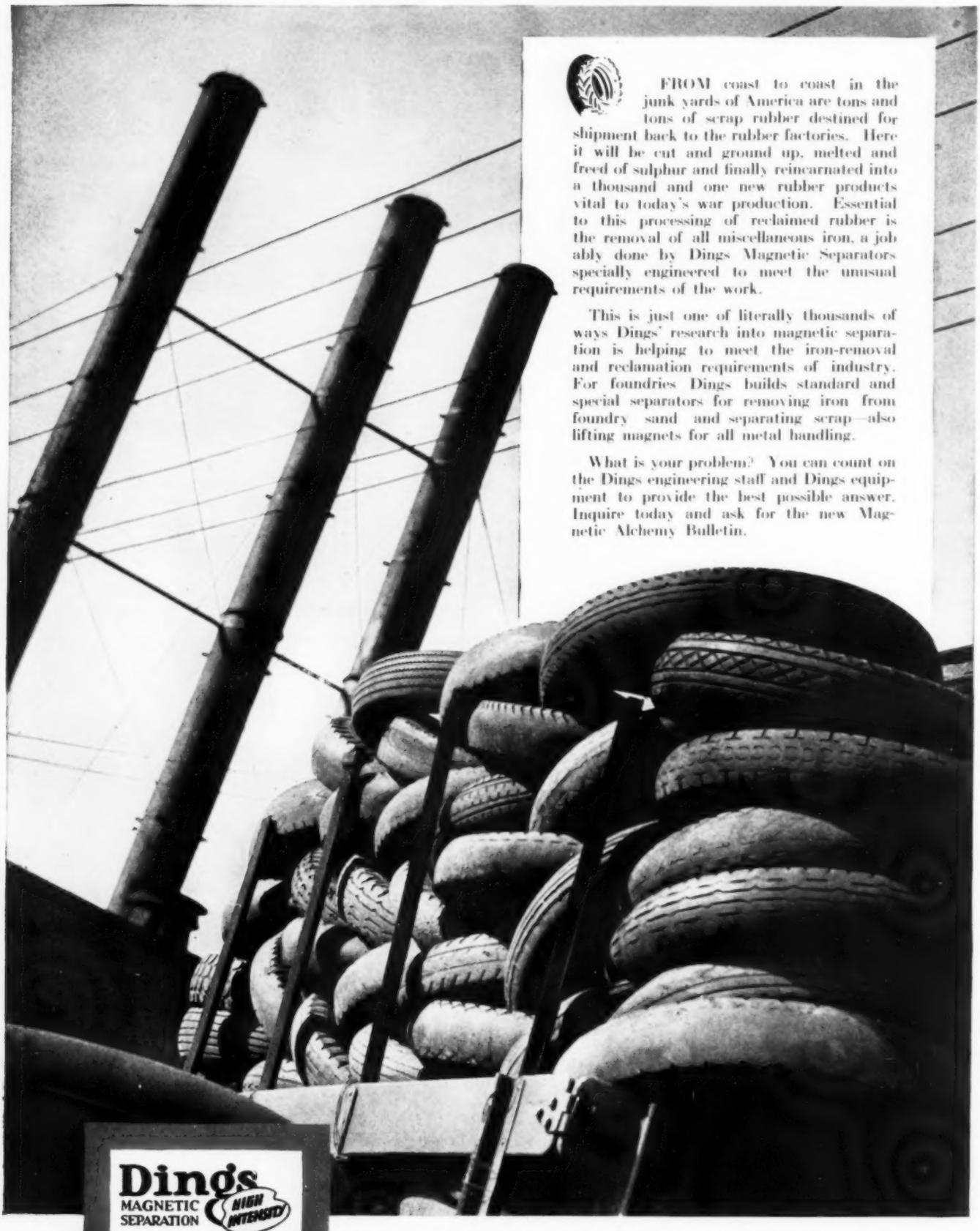
NORTON COMPANY
Worcester, Mass.

Distributors in All Principal Cities

W-858

NORTON ABRASIVES

SCHEDULED FOR REINCARNATION



FROM coast to coast in the junk yards of America are tons and tons of scrap rubber destined for shipment back to the rubber factories. Here it will be cut and ground up, melted and freed of sulphur and finally reincarnated into a thousand and one new rubber products vital to today's war production. Essential to this processing of reclaimed rubber is the removal of all miscellaneous iron, a job ably done by Dings Magnetic Separators specially engineered to meet the unusual requirements of the work.

This is just one of literally thousands of ways Dings' research into magnetic separation is helping to meet the iron-removal and reclamation requirements of industry. For foundries Dings builds standard and special separators for removing iron from foundry sand and separating scrap—also lifting magnets for all metal handling.

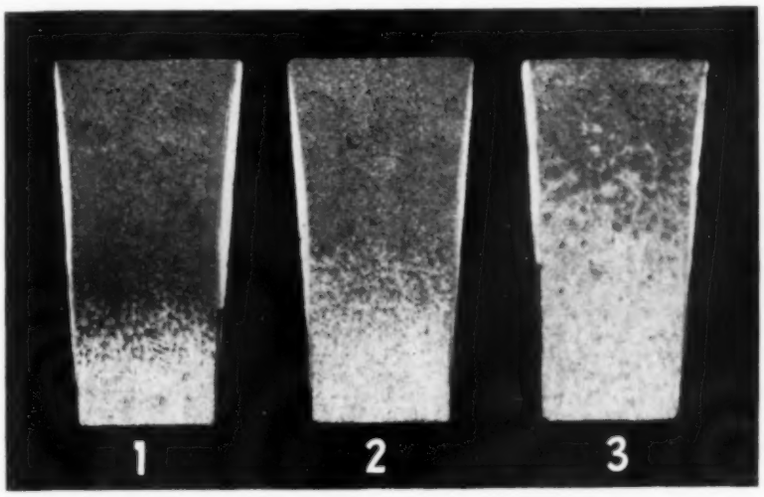
What is your problem? You can count on the Dings engineering staff and Dings equipment to provide the best possible answer. Inquire today and ask for the new Magnetic Alchemy Bulletin.

Dings MAGNETIC SEPARATION — HIGH INTENSITY

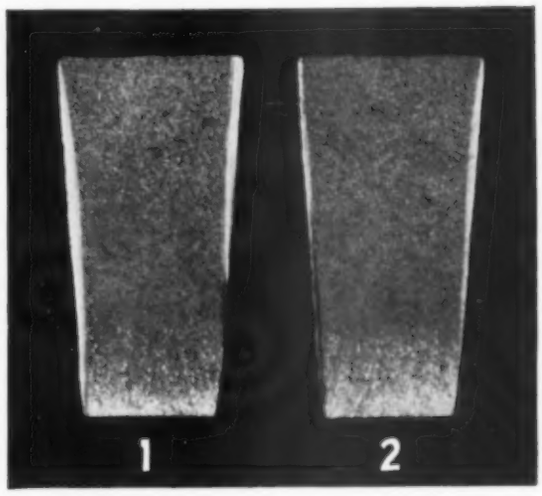
THE DINGS MAGNETIC SEPARATOR CO., 512 E. Smith St., Milwaukee, Wis.

How You Can Help to Conserve Chromium

by Using S.M. Ferrochrome



Chill bars of a hard base iron, showing the effect of adding 0.50 per cent chromium in the ladle. 1. *No chromium added.* 2. *Chromium added as Foundry Grade Ferrochrome.* 3. *Chromium added as S.M. Ferrochrome. Observe that the latter produces a considerably greater increase in the depth of chill, showing that less of this alloy is needed.*



Chill bars of a soft base iron, showing the effect of adding 0.50 per cent chromium in the ladle. 1. *Chromium added as Foundry Grade Ferrochrome.* 2. *Chromium added as S.M. Ferrochrome. The latter again produces a deeper chill.*

WHEN you use S.M. Ferrochrome to add chromium to cast iron in the ladle, you don't need to add as much chromium to obtain a desired increase in chill as with other chromium alloys. S.M. Ferrochrome dissolves more readily in the molten metal and results in a higher recovery of chromium and a greater increase in the depth of chill per unit of chromium added. Thus the use of this recently developed alloy helps to conserve chromium, a strategic material.

Because S.M. Ferrochrome dissolves rapidly in the molten metal, it results in uniform distribution of the chromium and thus prevents the formation of hard spots in the iron caused by incomplete solution. Also, the use of this alloy permits the satisfactory ladle addition of larger amounts of chromium with recoveries of 90 per cent or more.

The addition of chromium to cast iron improves its wear resistance, minimizes growth at high temperatures, increases its resistance to heat, and improves its physical properties. With S.M. Ferrochrome, these extra qualities can be quickly and easily imparted to cast iron in the ladle.

One of our metallurgists will gladly call and explain further how you can help to conserve chromium by using S.M. Ferrochrome for making ladle additions to cast iron. He can tell you also about other "Electromet" ferro-alloys for the cast iron foundry and can give you practical help in their efficient use to obtain quality iron at low cost. This service is yours for the asking.

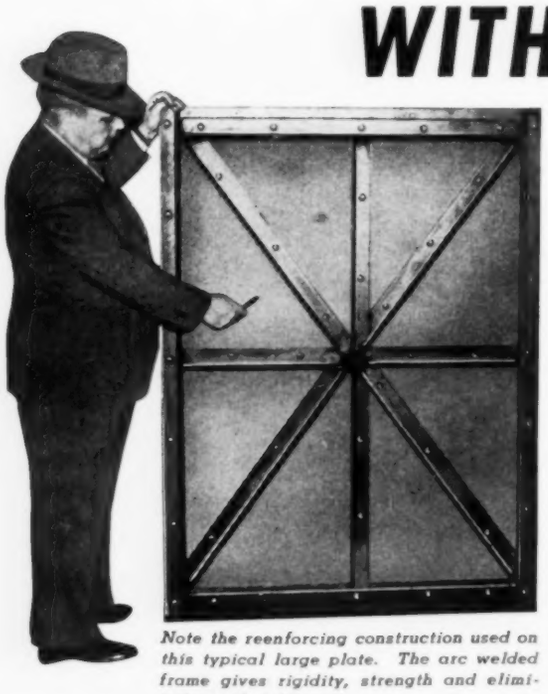
ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York, N. Y.

The word "Electromet" is a registered trade-mark of Electro Metallurgical Company.

"Electromet" Ferro-Alloys and Metals are available through offices of Electro Metallurgical Sales Corporation in Birmingham, Chicago, Cleveland, Detroit, New York, Pittsburgh, and San Francisco. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Electromet
Trade-Mark
Ferro-Alloys & Metals

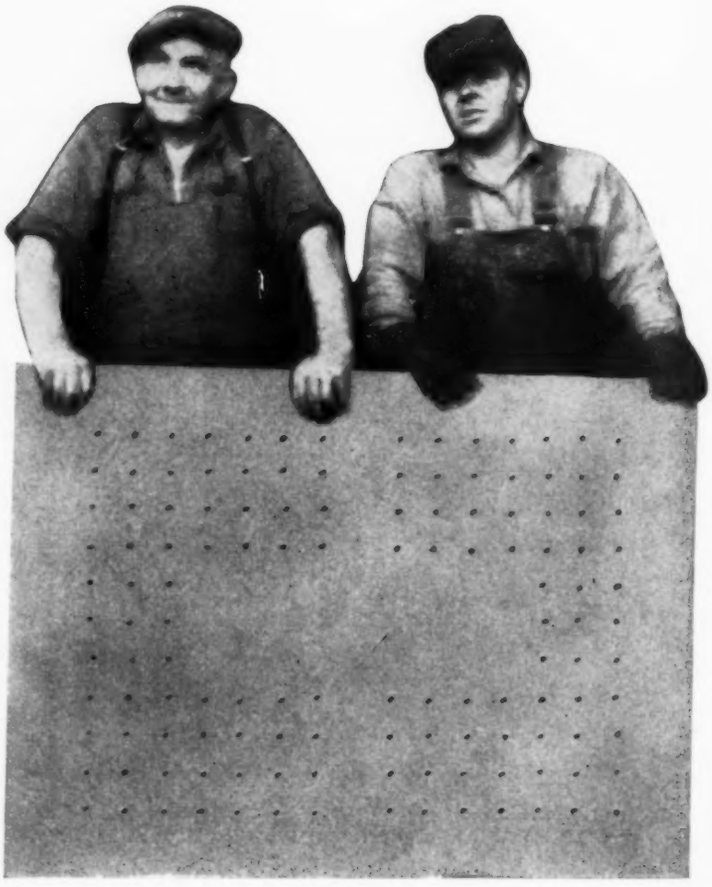
CARRY CORES UP TO 1200 LBS. WITHOUT DEFLECTION!



Note the reenforcing construction used on this typical large plate. The arc welded frame gives rigidity, strength and eliminates deflection.

IT IS BEING DONE ON DIAMOND REENFORCED STEEL CORE PLATES

These special core plates are designed to carry large cores up to 1200 lbs., cores of any size, without deflection or warping.



You may obtain Diamond Core Plates to suit your own special requirements. They are furnished with or without perforations and in all smaller, standard sizes—plain or reenforced as indicated by your needs.

Send us detailed information on your core baking problem and we'll be glad to design a plate to handle the job. Weight of core and dimensions, in particular.

DIAMOND

CLAMP AND FLASK COMPANY

Telephone 2553 **Richmond, Indiana**

Designers of CORE PLATES, JACKETS, BANDS, FLASKS since 1889

this latest SWINDELL

ELECTRIC ARC MELTING FURNACE *is producing* FINE STEEL FOR VICTORY

EVERY advantage enabling better production of electric furnace steel is inherent in modern SWINDELL units. Top-charging, swinging roof design joins with the four-point roof suspension and integrated construction of roof operating mechanism to provide greater capacity—greater strength—greater simplicity—*dependable performance*. Let us figure on your requirements.

SWINDELL-DRESSLER *Corporation*

DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES

PITTSBURGH, PA.

THE DUTY THAT WE OF THE SECOND LINE OF DEFENSE HAVE

TO PERFORM TO THE UTMOST LIMIT

IS

THE GREATEST POSSIBLE PRODUCTION OF VITAL MATERIALS,

THE ADEQUATE PURCHASE OF DEFENSE BONDS AND STAMPS,

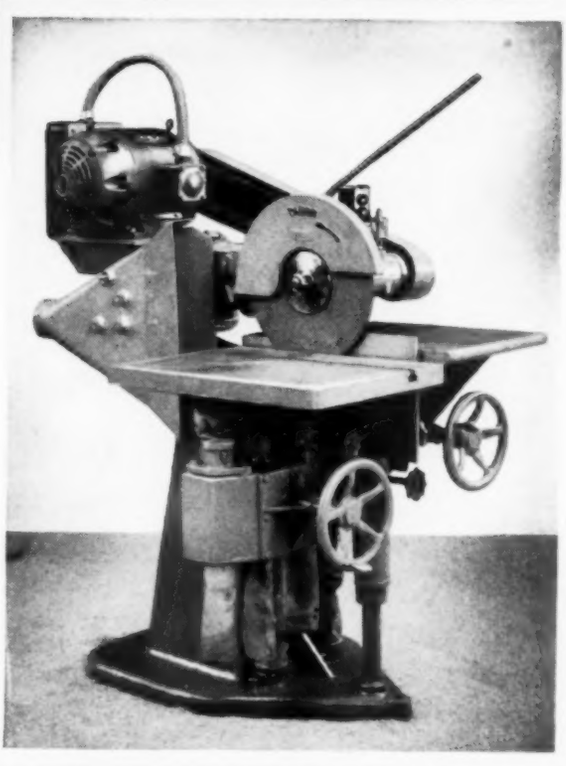
THE NECESSARY SUPPORT OF THE AMERICAN RED CROSS.

Ohio Ferro-Alloys Corporation

Canton, Ohio

Save PRICELESS TIME with the...

TABOR-BRASIVE CUT-OFF MACHINE



The above-all need of the day is high and ever higher production. Between pouring and shipping no time can be lost . . . and none need be.

A Tabor-Brasive Cut-Off Machine will more than keep pace with your increased production schedules. It will cut gates and risers from castings of manganese bronze, aluminum bronze, nickel, monel and other tough-cutting metals in a matter of seconds—unbelievably fast. Cuts are clean and close to the casting—snagging and finishing grinding are reduced to a minimum, often entirely eliminated.

Write for information, giving details of your cutting problems. There is a Tabor-Brasive Cut-Off Machine of a size and type to meet your requirements.

THE TABOR MANUFACTURING COMPANY
6225 Tacony Street • Philadelphia • Pennsylvania

Representatives: *Los Angeles, Calif.,* Snyder Foundry and Supply Co.; *Oakland, Calif.,* Pacific Graphite Co.; *Seattle, Wash.,* Carl F. Miller & Co.

CLEVELAND is ready

46th Annual A. F. A. Convention and Exhibit

•

First Western Hemisphere Foundry Congress

OUR Public Auditorium has been swept and dusted—and when its doors swing open on Monday morning April 20th, you will realize that the greatest of all foundry shows has been staged for your benefit and education.

Many of the foundrymen who will be eagerly viewing the extensive exhibits of equipment, accessories and supplies will also study the U. S. Ordnance Association display of defense castings.

The Technical sessions will be unusually interesting and instructive and this short time spent with your fellow foundrymen will amount to an investment in the future of your own foundry as well as the advancement of the entire foundry industry. Plan to be in Cleveland for this great convention.

APRIL 20-21-2

....FOUNDRYMEN!

and

THE FOUNDRY

Presents

FOR APRIL

THE PRE-CONVENTION ISSUE

. . . pre-viewing this great convention—new and improved equipment to be displayed—new processes in material handling—new methods in foundry practice to be discussed—a complete program of the entire six days . . . technical sessions . . . plant visitation . . . social and entertainment plans . . . places to see . . . things to do . . . all this *in addition* to the many worthwhile editorial features and valuable and pertinent information of interest to *all* foundrymen found in every issue of The Foundry.

Advertising forms close March 9.

FOR MAY

THE POST-CONVENTION ISSUE

. . . a printed record of what actually took place at the convention . . . reports of technical sessions . . . the exhibition . . . who was there . . . what they said and did . . . in fact the May Post-Convention issue of The Foundry could well be indexed as a reference volume and made a valuable addition to your foundry library.

For those thousands of foundrymen who can attend the convention, the May issue of The Foundry will serve as a diary of the profitable and pleasant contacts with fellow foundrymen during the days in Cleveland. For those who cannot attend, this important issue of The Foundry *will be the convention itself!* For *all* it will preserve this Convention in word and picture.

Advertising forms close April 9.

NOTE: *To all manufacturers and suppliers who in any way contact, sell and serve the foundry industry, these two issues of The Foundry present an invaluable advertising opportunity at a time when the eyes of the entire foundry industry will be focused on the Cleveland convention.*

22-23-24, 1942

"The next number will be free with 6 box tops, followed by occasional showers"

Doubletalk? No, it's how radio would sound if stations couldn't be kept on their assigned frequencies. The problem was licked once and for all when engineers discovered how to regulate radio frequencies with a tiny disc of quartz crystal, the thickness of which governs the length of the waves. Precision cutting, grinding and finishing of the quartz, a process Carborundum helped pioneer, makes today's accurate control possible.

No larger than a thumb nail, only about 1/16th inch thick, these oscillators must be finished to limits as close as 1/100th the diameter of a hair. With the aid of Carborundum Brand Abrasive Grains and Powders, the discs are made with optically flat and parallel surfaces, and thickness so accurate it must be measured in terms of light wave length.

In the development of many modern aids to living, abrasives have played a vital part. And Carborundum skill and knowledge have made much of this progress possible. Perhaps these facilities can help you solve your problem. The Carborundum Company, Niagara Falls, New York.

CARBORUNDUM
ABRASIVE PRODUCTS

Carborundum is a registered trade mark of and indicates manufacture by The Carborundum Company

REGO

KX

CUTTING TORCH

rings speed and economy to
housands of cutting jobs. Here's why!

Special head withstands terrific heat without distorting . . . no leaks from warped head seats . . . no repairs from stripped threads.

Triangular tube arrangement has greater strength and rigidity. Tubes brazed at the head and valve body assure leakproof joints.

KX TIPS for SPEED and ECONOMY!
On any metal thickness . . . clean or dirty . . . there's a KX tip that will do the job better!
RegO KX tips are designed to give ideal gas mixture for fast and economical preheating . . . and to assure perfect head seating.

High pressure valve assembly in the KX is leakproof . . . special diaphragm replaces packing used in ordinary construction.

Get all facts . . . send for 4-page KX folder!

REGO . . . pioneer equipment for using and controlling high pressure gases . . . distributed by

NATIONAL CYLINDER GAS COMPANY

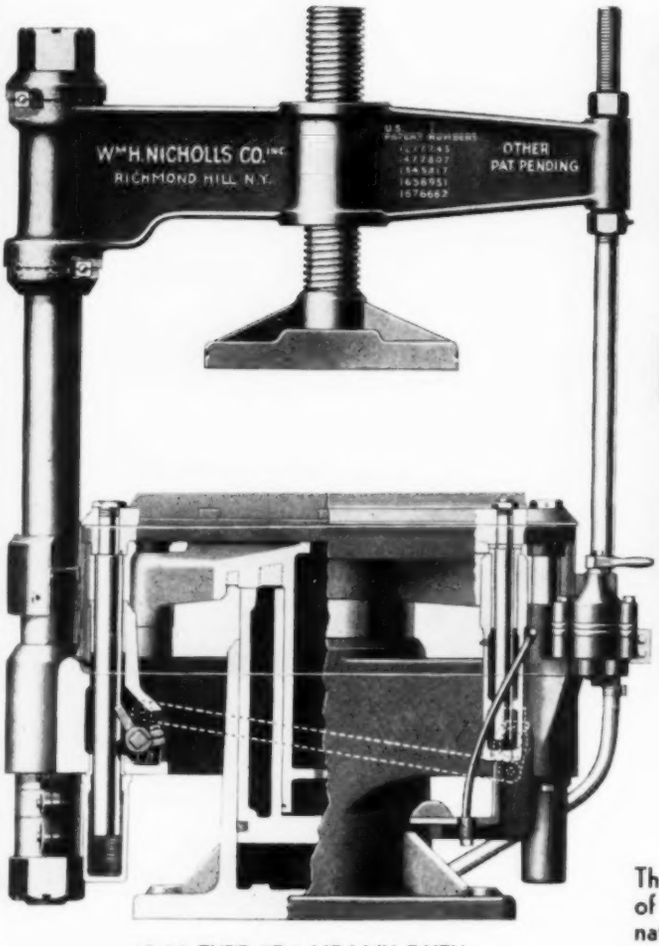
205 W. Wacker Drive — Chicago, Illinois

Offices in Principal Cities

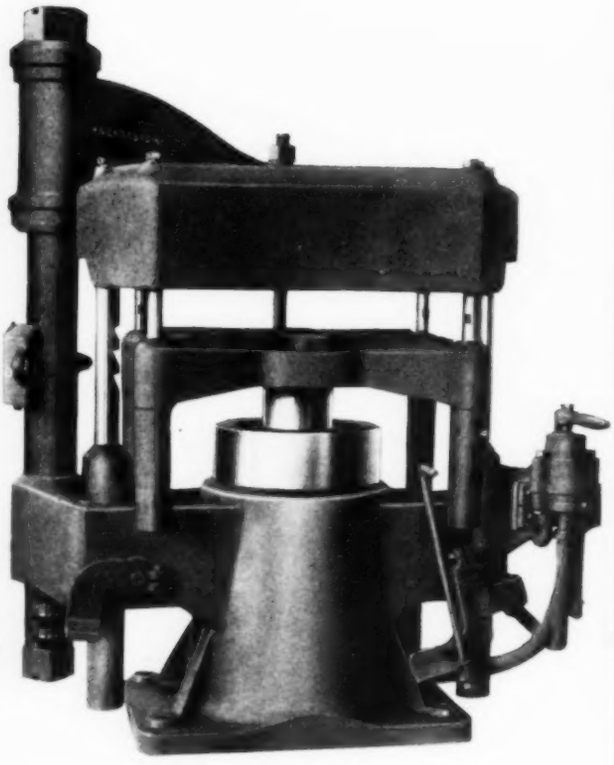
MOLDING MACHINES

For Speed, Durability and Quality Castings

Jolt, Squeeze and Pattern Draw



12-36 TYPE "D" HEAVY DUTY
SECTIONAL VIEW



14-36 TYPE "D" HEAVY DUTY
IN RAISED POSITION

These machines have filled an important part in the success of many large foundries all over the world. This international acceptance is due to their ability to "stand up" under the heaviest production. The policy of "NICHOLLS" is to design molding machines with the minimum number of parts; machines of extreme ruggedness assuring lower maintenance and machines which can be operated by unskilled workmen.

If you will send us a sketch of your patterns, flask sizes and approximate number of molds required per day from each pattern, we will be pleased to make recommendations without any obligation on your part.

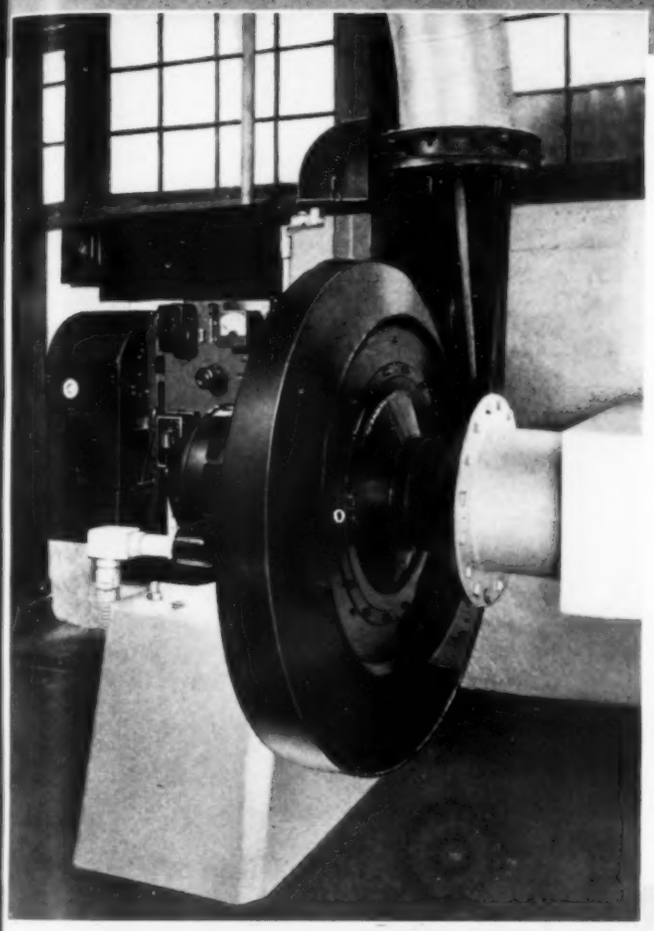
Wm. H. NICHOLLS Co., Inc.
RICHMOND HILL, LONG ISLAND, NEW YORK

Established 1910

Foreign Manufacturers and Selling Agents—
For Continental Europe and Great Britain—The George Fischer Steel and Iron Works, Schaffhausen, Switzerland

NICHOLLS

This HEAVY-DUTY BLOWER
WEIGHS THE AIR GOING TO YOUR CUPOLA



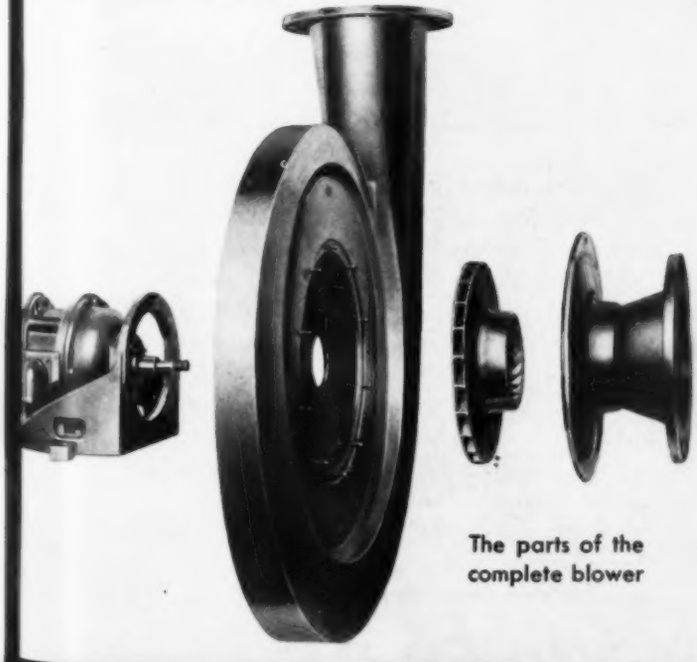
A Control Backed by 15 Years of Foundry Use. The constant air-weight control of the Ingersoll-Rand Cupola Blower is an all-electric mechanism developed around the power characteristics of these machines. It requires no pampering, no laboratory conditions for accurate regulation of the air blast.

Simple, Compact Assembly. Few machines for foundry use require less attention and maintenance than the Ingersoll-Rand Cupola Blower. Its single rotating element is carried on grease-packed ball bearings which require greasing but once or twice a year.

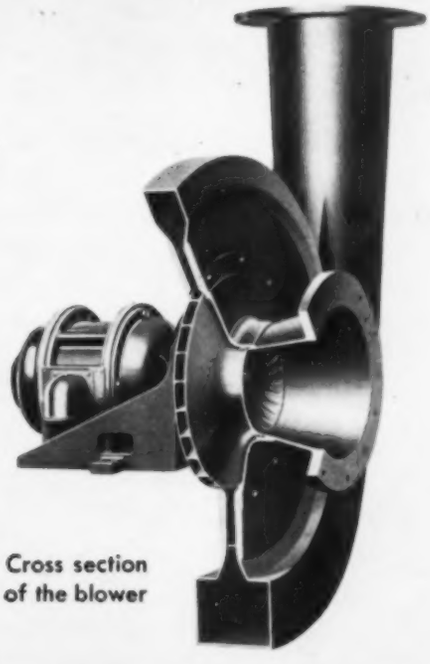
A Minimum of Parts. The fabricated steel construction and the single-stage design result in a sturdy, smooth-running machine.

Write or call the nearest Ingersoll-Rand branch office for complete information.

12-136

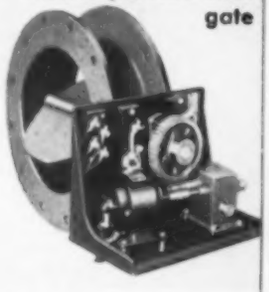


The parts of the complete blower



Cross section of the blower

Motor-operated blast gate



Control panel

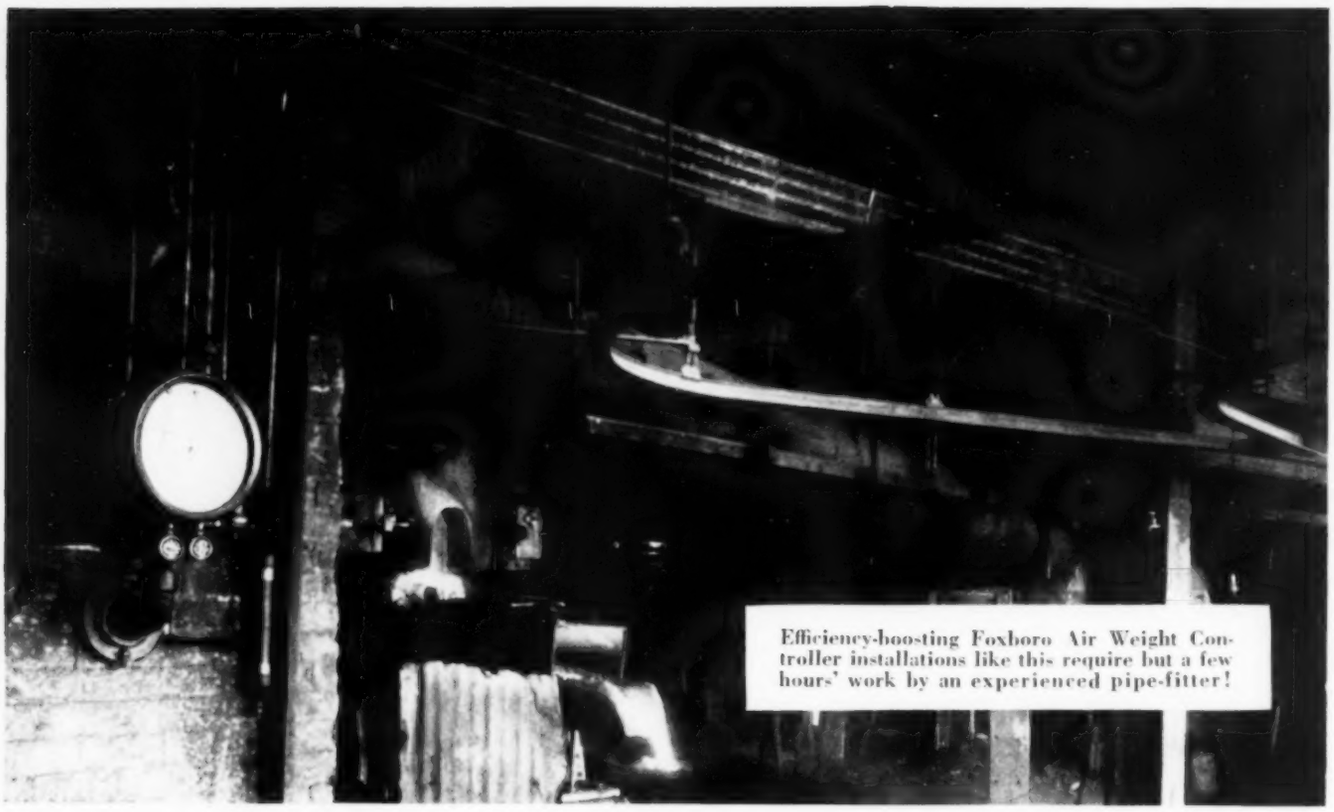
Atlanta Chicago Detroit Kansas City Philadelphia Scranton
Birmingham Cincinnati Duluth Knoxville Picher Seattle
Boston Cleveland El Paso Los Angeles Pittsburgh St. Louis
Buffalo Dallas Hartford Newark Pottsville Tulsa
Butte Denver Houston New Orleans Salt Lake City Washington
New York San Francisco

Ingersoll-Rand
11 BROADWAY, NEW YORK CITY
Branches or Distributors in other Principal cities the world over.

Buenos Aires Calcutta Caracas Havana Johannesburg Lima Lisbon London Lyons Madrid Melbourne Mexico Montreal Rio de Janeiro

This "Phantom Foundryman"

SAVES PIGGING AND REJECTS!



Efficiency-boosting Foxboro Air Weight Controller installations like this require but a few hours' work by an experienced pipe-fitter!

Easily-installed Foxboro Controller keeps heats hotter, more uniform.

Every day is a "good pouring day" where cupolas are equipped with a Foxboro Air Weight Controller. This "phantom foundryman" automatically controls the blast to supply a constant *weight* of air per minute, regardless of the blast-line pressure, atmospheric temperature or barometric pressure!

All you do is set the index pointer on the instrument for the desired blast. From the first tap to the last, you'll get consistently better combustion . . . hotter heats with less burning . . . uniform pouring conditions that reduce imperfect castings and practically eliminate pigging.

Write for Bulletin B-268 on Foxboro Air Weight Controllers, or for detailed information on any other instruments you may need. The "Phantom Foundryman" is only one example of Foxboro's Creative Instrumentation to make industrial processes operate more productively. **The Foxboro Company, 32 Neponset Avenue, Foxboro, Mass. U. S. A.** Branches in principal cities of U. S. and Canada.

RECORDING · CONTROLLING · INDICATING

FOXBORO
REG. U. S. PAT. OFF.
Instrumentation

Model "C-4" Royer in foundry of T. B. Wood's Sons Co., Chambersburg, Pa., makers of power transmission machinery.

Cut Discount Losses with a Royer!

The major cause of run-outs, drops, surface inclusions and rough finish is poorly conditioned sand. In today's rush, sand takes a lot of punishment and thorough sand preparation is more important than ever before.

You can cut discount losses with Royer-prepared sand, as the majority of foundries have found out, because the Royer gives sand a work-out that it can't get from riddling or screening.

A "thousand fingers" go to work on your hot, gassy, tight sand when it contacts the Royer's "combing belt" and they open it up, breaking clay balls and taking out hard, fused lumps and trash that might pass a screen and spoil a mold.

Those thousand fingers on the Royer's "combing belt" blend and mix, work the moisture through the heap and aerate the sand—and it's aerated again as it is being discharged. Backing, facing or core sand are all thoroughly conditioned with a Royer.

Every minute counts in the battle of production—don't let sand troubles stymie your foundry—there's a Royer for every jobbing and production shop — grey iron, steel, malleable, nonferrous. Stationary and Portable models—many available from stock. Jump the gun—order now!

Two More Royers for General Electric

A Model "NB-2" recently purchased for their Philadelphia plant and a Model "NC-4" for their Erie plant makes a total of 19 Royers ordered by General Electric Company.*

Royer users "repeat" because it is the only sand separator and blender that gives them essential "6 point" sand conditioning:

1. Thorough refuse removal
2. Positive lump breaking
3. Complete blending and mixing
4. Distributes moisture evenly
5. Increases permeability
6. Double aerates —once on the belt and once as sand is being discharged.

You can sell almost anything once — but repeat orders can only result from satisfied users!

*In the U. S alone.

THE ROYER

ROYER FOUNDRY & MACHINE CO. KINGSTON, PA.

WASHED DRIED AND SCREENED SILICA SAND

Carefully Selected and Graded for Foundry Use—

FOUNDRY men throughout the country know the exceptional qualities of the uniformly screened grades of silica sand produced by the Ottawa Silica Company.

The grains being almost spherical, afford greater permeability and consequently finer sand can be used, effecting better finish.

Ottawa sands are durable! They do not break up! They are ideal for sand slinger work and are without equal for all foundry purposes where synthetic sands are employed.

FLINT
MOLDING AND CORE SAND
SILICA

A HARD, fast-cutting, thoroughly washed, dried Sandblast Sand, screened to uniform size, is produced by the Ottawa Silica Company and sold under the trade names FLINT SHOT and DIAMOND SANDBLAST SAND. It is the most economical agent that can be employed for all kinds of exacting sandblast cleaning. The round, pearl-like grains are hard as flint. They do not split up, but wear down uniformly and can be used over again many times. This abrasive flows freely, requiring less air power and gives the castings a smooth, silvery-like, velvety finish. Ask for our booklet, "Sandblasting Up To Date".

FLINT
IT PAYS TO USE
SHOT

DIAMOND
SAND BLAST

THE Ottawa Silica Company's three mills operate continuously the year round, making it possible to supply foundries with material promptly. Production includes a complete line of foundry sands suitable for molds, cores, furnace bottoms, sandblasting, for use generally in the steel, grey iron and non-ferrous fields—also Ground Silica (Silica Flour). The Ottawa Silica Company's engineering staff is always available for consultation and service on problems relative to the use of Ottawa Sands.

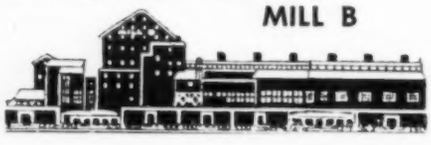
CRYSTAL
99% PURE
SILICA

OTTAWA SILICA COMPANY

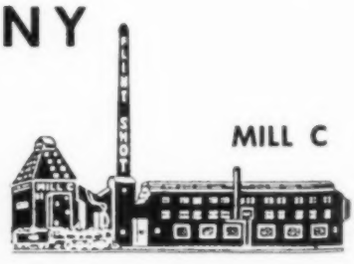
Ottawa, Illinois

MILL A

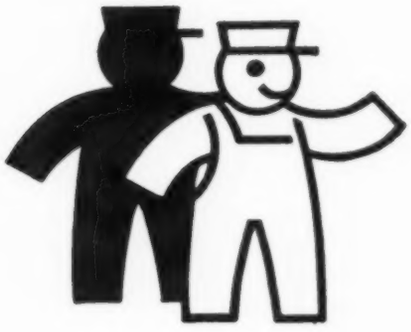
MILL B



MILL C



Meet "DOUBLE EDDY"*



* Symbolizing the harnessed power of the double eddy current—an exclusive advantage of the Buell (van Tongeren) Dust Recovery System.

MISCHIEF-MAKER FOR EVERYONE BUT BUELL

"Double Eddy" is the little-man-who-saves-you-money on dust recovery. He works exclusively for Buell—and, on Buell equipment, has proved his ability as a dust recovery man all over the world, in every industry where dust is a problem.

The double eddy (an air current phenomenon present in all cyclone-type dust collectors) is a mischief-maker for everyone but Buell—causing trouble, cutting down efficiency. The reason? *No one but Buell can use the van Tongeren Cyclone!* This patented system embodies the only known method of harnessing the energy of the double eddy current to increase collection efficiency *on all dust sizes.*

For the complete story of "Double Eddy", send for our 24-page "Bulletin F-3 Dust in Industry".

BUELL'S 6 PLUSES

These are the *plus* advantages that give Buell (van Tongeren) Dust Recovery Systems outstanding superiority...

- *High Recovery Efficiency*
- *Low First Cost*
- *Low Maintenance*
- *Long Life*
- *Unlimited Capacity*
- *Fractional Efficiency Performance Guarantees*

BUELL ENGINEERING CO., Inc., *14 Cedar Street, New York*

Nation-wide service through offices of either Buell Engineering Co. or B. F. Sturtevant Co.

buell
DUST RECOVERY SYSTEMS

CONSULT BUELL *First* IN DUST RECOVERY

for Chemical • Rock Product • Metallic • Food • Flue or any other dusts

++++++++++++++++++++++++

Why your Red Cross urgently needs

FIFTY MILLION DOLLARS, NOW

How the fund is allocated . . . What it does in service

Every dollar that you give now to your Red Cross marches into the thick of things where humanitarian help is needed most—up to the fronts and battle stations where the fighting is heaviest. Into the Red Cross hospitals and First Aid units where prompt medical attention and supplies may save innumerable lives. And throughout our broad land to train and equip volunteers to meet any emergency that may strike.

How the $50,000,000 War Fund is Used

SERVICE TO THE ARMED FORCES • • • • • $25,000,000

Provides for the care, welfare and morale of the Army and Navy, including services to men in hospitals and during convalescence. • Provides an important link between the service men and their families; keeps the families from breaking up, supplies food, shelter, medicine, and even jobs where necessary. • Provides essential medical and other supplies outside of standard Government equipment. • Operates Red Cross headquarters at camps and naval stations. • Enrolls blood donors and medical technologists for Army and Navy needs. • Provides millions of surgical dressings, sweaters, socks, etc. through volunteer workers.

DISASTER AND CIVILIAN EMERGENCY RELIEF • $10,000,000

Supplies emergency needs for food, clothing, shelter and medical attention for disaster victims. • Assists striken families in repair of homes and other adjustments; provides minimum reserves of essential relief supplies to prevent unnecessary delays.

CIVILIAN DEFENSE SERVICES • • • • • • • $ 5,000,000

Trains volunteers for home nursing and nurses' aides. • Trains nurses, men and women, for active duty with the Army and Navy. • Trains volunteers in First Aid and accident prevention. • Trains volunteers for work in Motor Corps, Canteen and Production. • Instructs men, women and children in preparedness against explosive and incendiary bombs. • Organizes for evacuation of children and their families from stricken areas. • Assists Red Cross Chapters in establishing effective coordination of emergency relief with local and State defense authorities.

SERVICE AND ASSISTANCE THROUGH CHAPTERS • $ 4,000,000

Gives assistance and service to the 3,740 Red Cross Chapters with their 6,131 Branches responsible for local Red Cross activities, particularly welfare work among the service men and their families.

OTHER ACTIVITIES AND CONTINGENCIES • • • $ 6,000,000

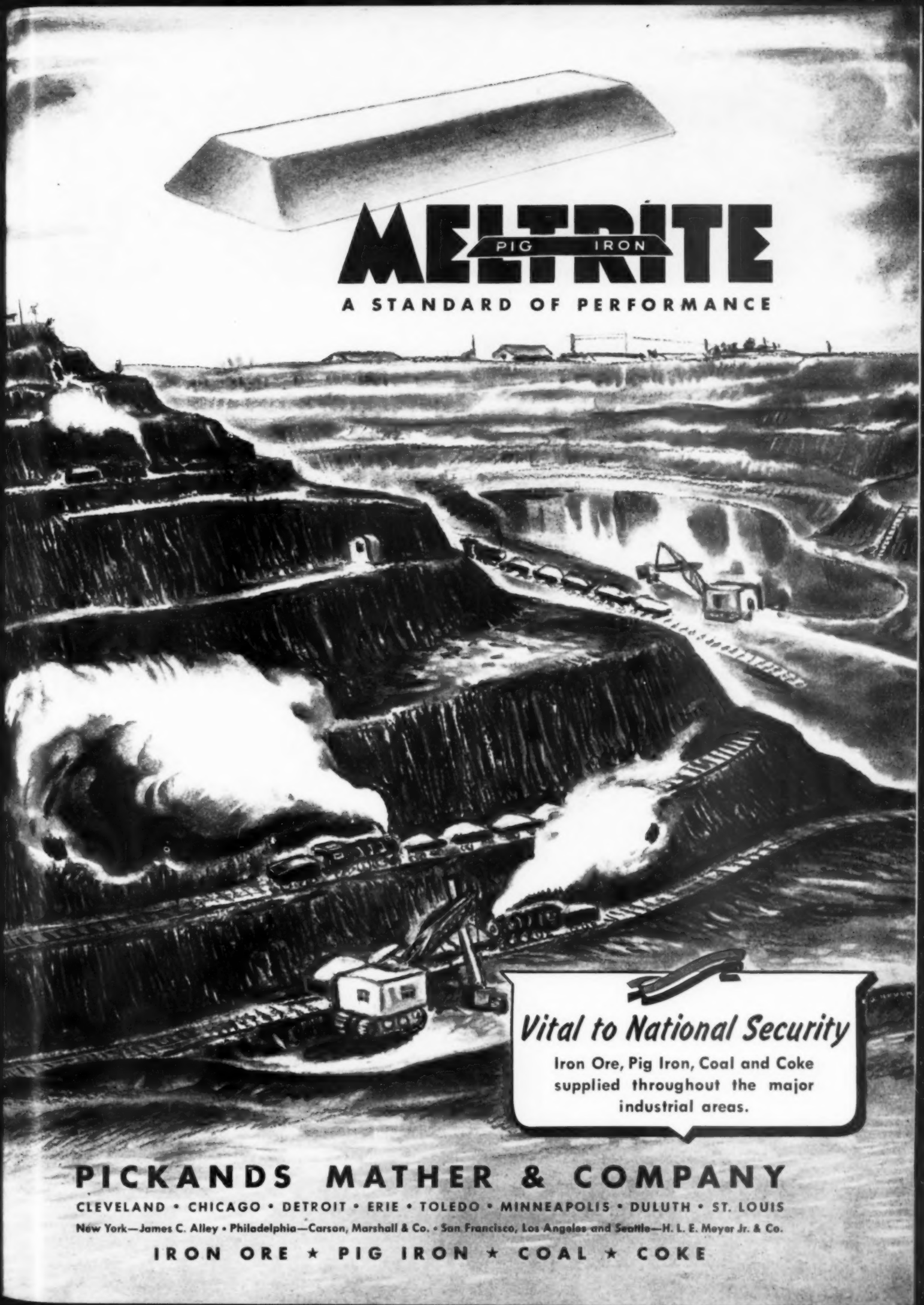
Provides for unforeseen expansions in program and for new activities made necessary by unexpected developments.

TOTAL • • • • • • • • • • • • • • • • $50,000,000

THE AMERICAN RED CROSS $50,000,000 WAR FUND

Note to Red Cross Canvassers: Use this material to better inform contributors how their donations are being expended.

(This space has been donated by THE FOUNDRY)


MELTRITE
PIG IRON
A STANDARD OF PERFORMANCE
Vital to National Security
Iron Ore, Pig Iron, Coal and Coke supplied throughout the major industrial areas.
PICKANDS MATHER & COMPANY
CLEVELAND • CHICAGO • DETROIT • ERIE • TOLEDO • MINNEAPOLIS • DULUTH • ST. LOUIS
New York—James C. Alley • Philadelphia—Carson, Marshall & Co. • San Francisco, Los Angeles and Seattle—H. L. E. Meyer Jr. & Co.
IRON ORE ★ PIG IRON ★ COAL ★ COKE

BAY STATE

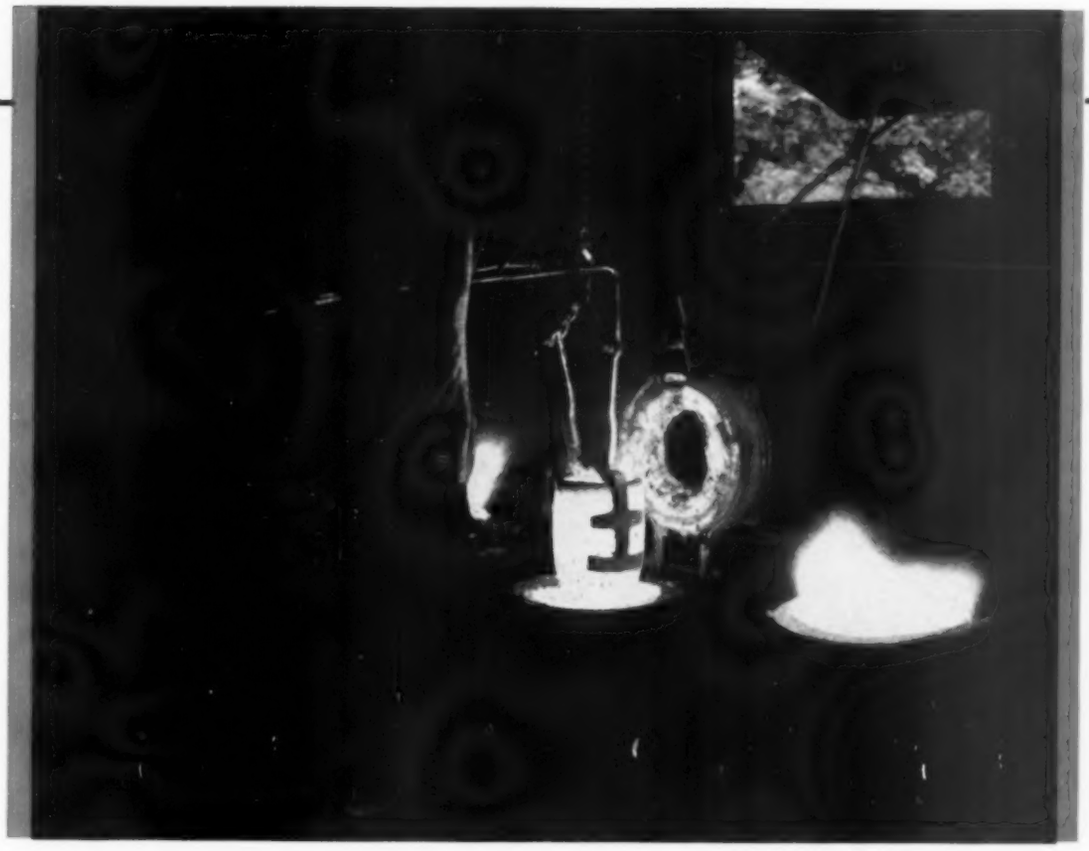
MOUNTED WHEELS • MOUNTED POINTS

You should have this new fully illustrated catalog. In its 32 pages may be found list prices, speed recommendations, mandrel information and other important data indispensable to portable grinder owners.

It is just off the press and is yours for the asking.

BAY STATE

ABRASIVE PRODUCTS CO., WESTBORO, MASS.



Before You **KNOCK OUT** *Your Walls*

Stop...

and ANALYZE THE PRODUCTION POSSIBILITIES

— of your present floor space. Knocking out your walls to permit the addition of new units to your present complement of melting furnaces may not be the answer. Replacing your old, or obsolete, equipment with modern Fisher Furnaces that are engineered to your plant layout and specific requirements can greatly increase your tonnage output without enlarging your melting room. Request complete information on Fisher Equipment and Engineering Service before you Knock Out your walls.

"Fisher Products for the Foundry" . . . . .

— is a very complete catalog on gas and oil fired equipment for the foundry. It includes, among other things: Stationary Crucible Furnaces; Tilting Type Crucible Furnaces—manually operated; Tilting Type Crucible Furnaces—Nose Pour, motor operated; Iron Pot Melting Furnaces; Aluminum Melting Furnaces—Stationary and Tilting Types; Combination Blowers and Oil Pump Systems; Centrifugal Blowers; Industrial Burners; Proportional Gas and Oil Burner Assemblies; Metering Valves; Blast Gates; etc. Request your free copy TODAY!

1742 NORTH KOLMAR AVE., CHICAGO, ILLINOIS

Fisher FURNACE COMPANY

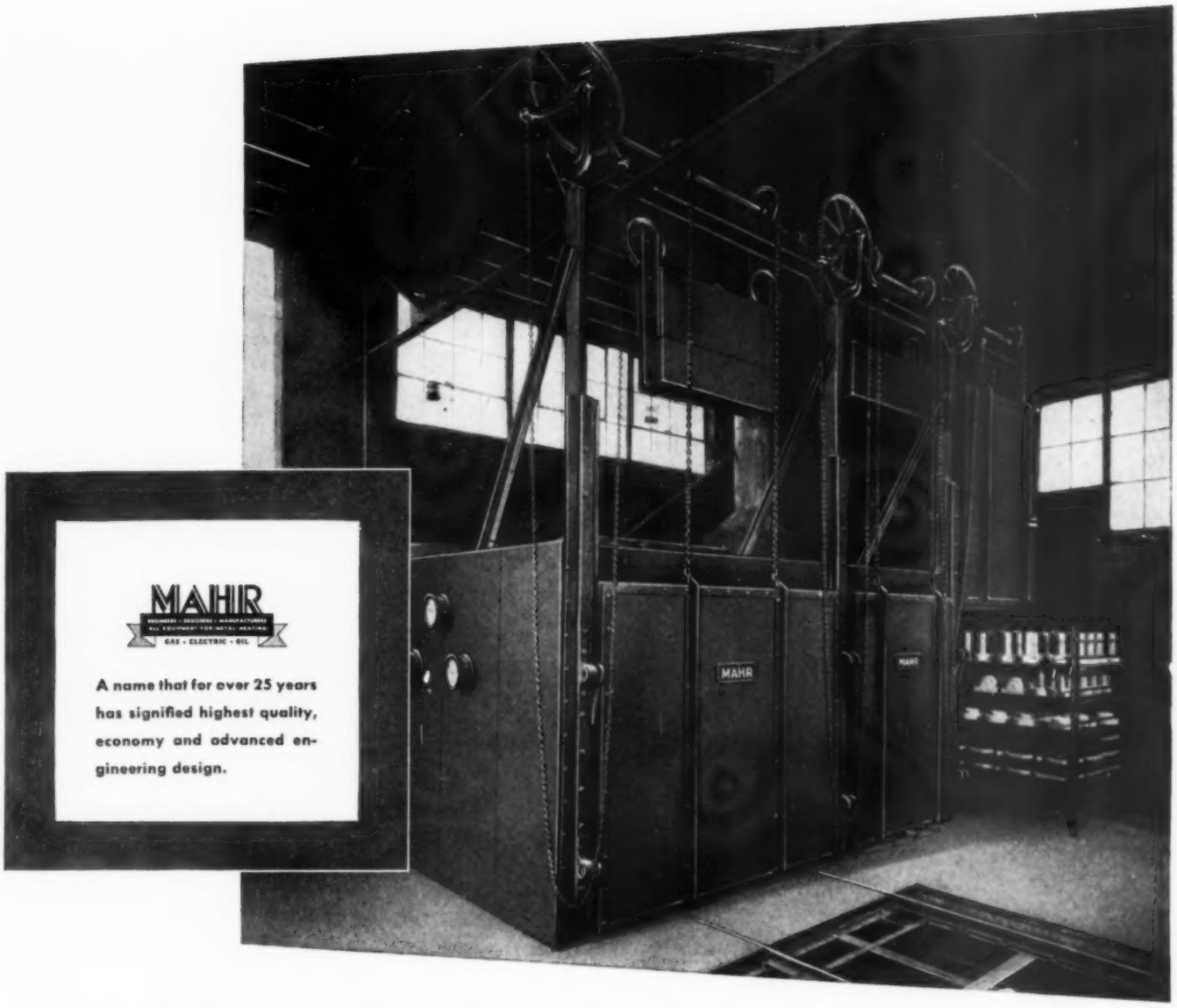
HAND GRINDING AND MIXING IS PICTURESQUE BUT . . .

These peasant girls of Vera Cruz, though husky, continue to resort to this crude grinding and mixing of maize to produce Mexico's universal bread —tortillas. Quaint as it be, the procedure would be most costly and uncertain in our more productive States . . . Cordip, the universal core wash having for its base—pure, natural amorphous Mexican graphite, removes the uncertainty of hand mixing. Unbalanced ingredients that comprise the average hand-mixed core wash usually prove costly in experiment time and resultant failures . . . Cordip is made in various grades to fit the entire field of core manufacture, no matter whether the cores are large or small, or a hard or soft coating is desired.

EWING GALLOWAY PHOTO

THE UNITED STATES GRAPHITE CO.
SAGINAW MICH.

CORDIP


MAHR
GAS • ELECTRIC • OIL
A name that for over 25 years has signified highest quality, economy and advanced engineering design.
MAHR

ASK FOR YOUR COPY OF THIS new BOOK

At the very foundations of our victory program stand the foundries of America. From them must flow, rapidly and continuously, the millions of castings needed for the tools of this war . . . Just off the press, this new MAHR Bulletin No. 750 tells the intimate and complete story of the ovens, furnaces, ladle dryers, torches etc. that play such an important part in the production of any good foundry. *Ask for it today!*

MAHR is making exceptionally prompt deliveries under unusual conditions. Ask about them.

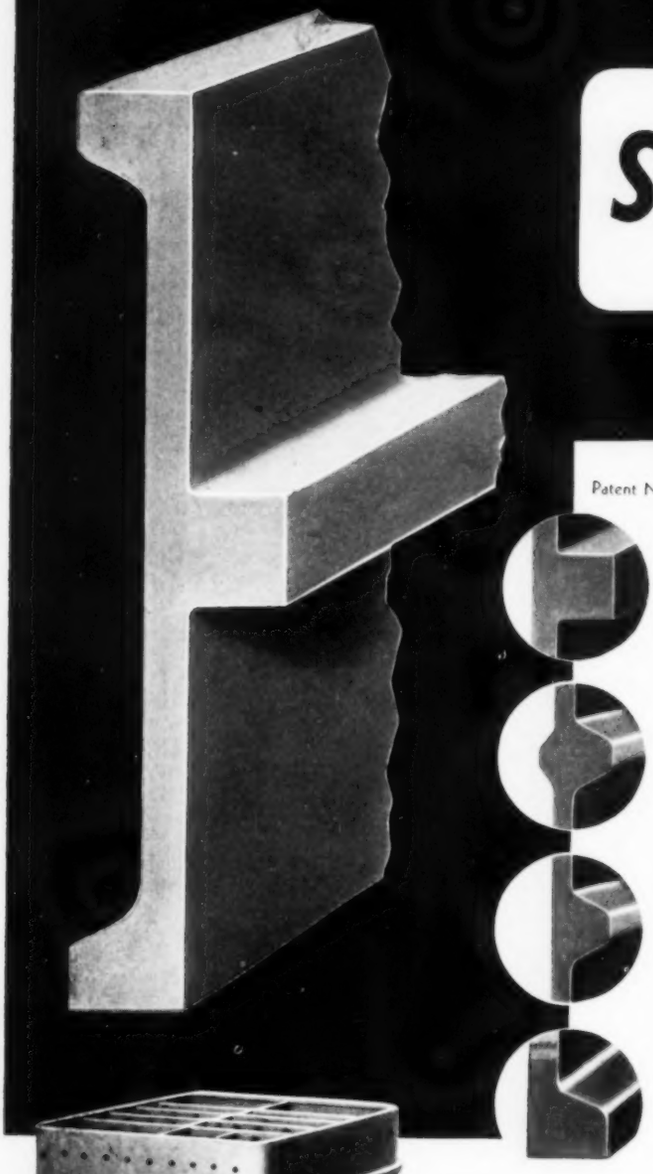
DIAMAHR

MAHR MANUFACTURING CO.

DIVISION OF DIAMOND IRON WORKS, INC.

MINNEAPOLIS, MINNESOTA, U. S. A.

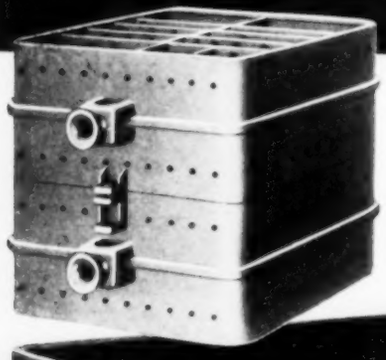
STRENGTH



Patent No. 1974292

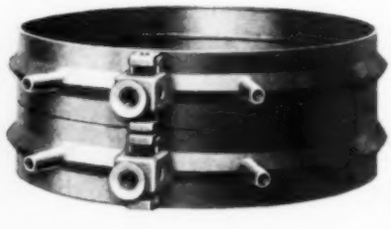
HERE IS a section through the metal in the side of a Sterling Flask. There is nothing to come loose. There is maximum strength and minimum weight. Add to that the advantage of all welded construction and the fact that every detail of design is up to the minute. That is why 3500 foundries have adopted Sterling Flasks for better efficiency, longer life and more profitable operation.

Sterling Flasks are made in a full range of sizes, styles and types. And every one is designed to do a better job. That is why more and more foundries have standardized on Sterling.



ROLLED STEEL WITH SOLID CENTER REINFORCING RIB AND SQUARE FLANGES; FULL WIDTH BEARING

Rolled copper bearing steel fabricated into one solid piece.



STERLING
WHEELBARROW COMPANY
MILWAUKEE, WISCONSIN

CHAMPION

Shortens the Reach ★ Lengthens the profits..

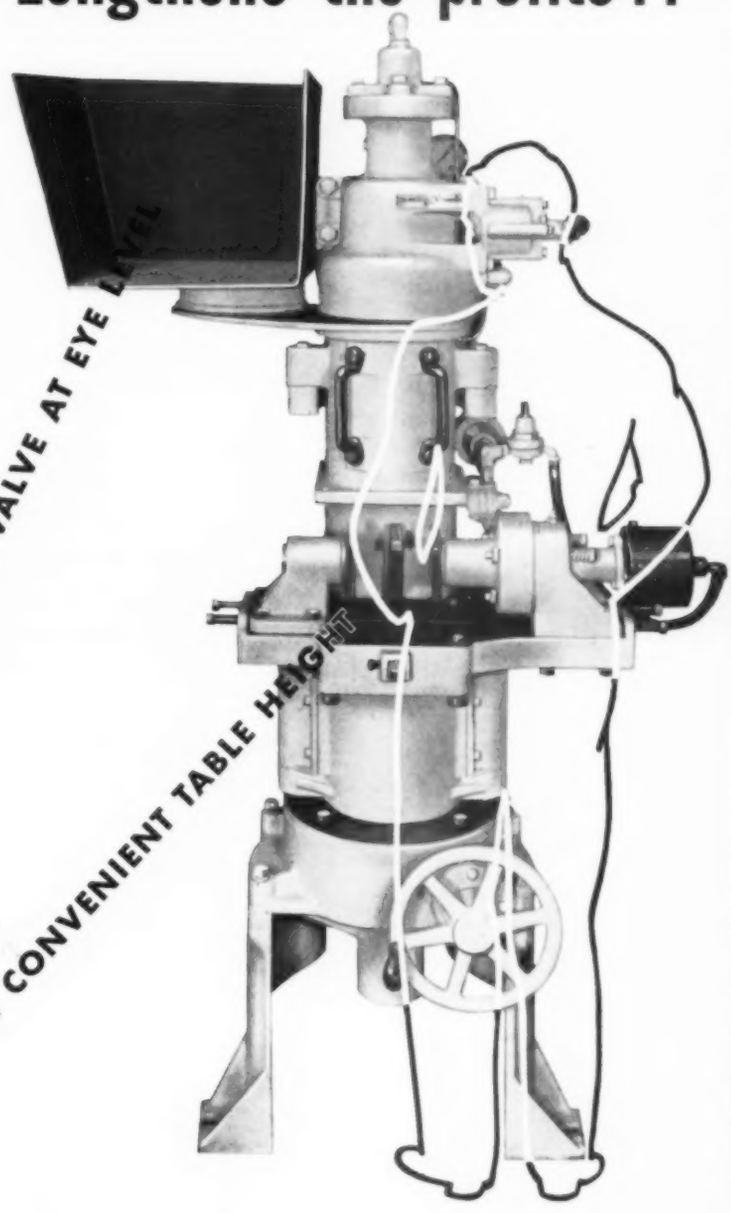
THERE ARE NO LOST MOTIONS in producing cores on the *CHAMPION CB-8 CORE BLOWER.* It is designed in every detail to ease the burden of labor and operate with a minimum of fatigue. There are no obstructions. Working table is completely accessible from three sides.

CHAMPION CORE BLOWERS earn greater profits because they produce cores faster, more economically and more accurately.

CHAMPION'S rigid one-piece cast steel frame insures accurate alignment of core box and blow plate. The exclusive air operated hydraulic clamp (patented) locks the split boxes securely and eliminates all possibility of separation. The instantaneous blow-valve action guards against air pressure leakage and dissipation enabling *CHAMPION* to produce cores that have been stumbling blocks for other mechanisms.

These are a few of the reasons why Liberty Foundry at Wauwatosa, Wisconsin, is producing 900 cores (left below) in 75 minutes on the *CHAMPION CB-8 CORE BLOWER* illustrated. This sensational core production program is being carried out with a *double unit* box and one inexperienced man who handles the complete operation.

These are a few of the reasons why Liberty Foundry phoned in a repeat order two days after the first *CHAMPION CB-8 CORE BLOWER* was installed in their shop . . . why Liberty Foundry is now successfully blowing the cores which they had tried without success previous to installing the *CHAMPION CB-8 CORE BLOWER.*



The front cover of *The Foundry* is a patriotic expression of appreciation. We have prepared a limited supply of this timely thought in 4 color process. As long as they last, we invite you to send for a copy suitable for framing and displaying in your home or office. Do not delay.

CHAMPION FOUNDRY & MACHINE COMPANY
1318 W. 21st Street • CHICAGO, ILLINOIS

TOMORROW'S IS MADE IN TODAY!

IT'S "MEN *and* MACHINES WORKING TOGETHER"—

WHEN **a torpedo labeled "U. S. A." plows its way through a foot of steel armorplate and an enemy ship goes down; *WHEN* a bombing squadron blows a hostile air base "sky-high"; *WHEN* a fleet of tanks crashes irresistibly through enemy lines.**

As Donald Nelson said recently: "Modern war is a war of materials and of productive systems . . . Today's army cannot be any better than its equipment—plus the ability of the people back home to replace that equipment in adequate volume."

Many, if not most, of the implements of war require cleaning at some stage in their manufacture. And that operation is frequently the starting point for production tie-ups and shipping delays.

Investigate this in your shop—don't let it happen there! You can prevent it with airless WHEELABRATING, the speed-cleaning process that is saving precious time in over 1300 plants by reducing cleaning operations to a matter of minutes.

REMEMBER PEARL HARBOR

ADVANTAGES of WHEELABRATING

1. HIGH SPEED CLEANING—reduces costs; speeds up shipment of orders.

2. CUTS CLEANING COSTS; saves power up to 80%; saves labor; saves space; saves abrasive; saves on operating and maintenance costs.

3. REMOVES ALL TRACE OF SAND AND SCALE with the result that: Machining and grinding are faster; Tools last longer; Inspection is simplified; Hardness readings are accurate.

4. IMPROVED APPEARANCE.

5. PROVIDES PERFECT BOND for final finishing.

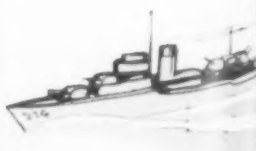
6. PRODUCES WIDE RANGE OF FINISHES.

7. HANDLES WIDE RANGE OF WORK.

8. ELIMINATES CHIPPED AND ROUNDED CORNERS.

SOME DEFENSE PRODUCTS BEING WHEELABRATED

BOMBS	RIFLE RECEIVERS
SHELLS	TANK TRANSMISSIONS
CARTRIDGE CLIPS	SUPERCHARGER PARTS
GUN BARRELS	AIRPLANE ENGINE PARTS
ARMOR PLATE	PROPELLER BLADES
TANK CASTINGS	ALUMINUM CRANKCASES
TANK TREADS	AIRPLANE LANDING GEARS
TRENCH MORTARS	TANK BOGIE WHEELS



WHEELABRATOR *Airless* ABRASIVE

HEADLINE NEWS
YOUR PLANT

AMERICAN
FOUNDRY EQUIPMENT CO.

505 S. BYRKIT STREET · MISHAWAKA, IN

THE AMERICAN MOLDER

Do you KNOW that . . . .

In addition to reducing cleaning time and improving the appearance of work, the Blackmer Pump Co., Grand Rapids, Mich., discovered the WHEELABRATOR Tumblast was cleaning their products so thoroughly that tool life on certain jobs had increased 300%.

•

All WHEELABRATOR Tumblasts use the exclusive American endless apron conveyor which completely exposes all surfaces of every piece to the full effect of the abrasive blast.

•

A large Eastern manufacturer of electrical equipment, using a No. 2 WHEELABRATOR Tablast having eight 24" dia. tables, cleaned 400,000 meter cases, parts, magnets, etc., last year at a 75% saving over the previous cleaning method.

•

There is a WHEELABRATOR Tumblast manufactured so small that operating loads of 1 cu. ft. can be cleaned in the same manner as in the larger machines.

•

Since 1934 over twenty-one million centrifugally cast brake drums have been cleaned in WHEELABRATOR Special Cabinets at Centrifugal Fusing Co., Lansing, Michigan.

BLAST EQUIPMENT ★★★★

A MAN OF IRON

–Always at Your Elbow

He was at your elbow in peacetime—always ready to roll up his sleeves and help you exterminate profit-eating, production-slowing "bugs" in your foundry operations. He's at your elbow now in wartime—anxious to pitch into your problems of changing over to the castings needed in our ever-growing schedule of *Production for Victory.*

He's the Republic Pig Iron Metallurgist—a technical man who knows irons, their qualities and their behavior in cupola, in ladle, in flask. But he's a practical man, too—an experienced foundryman who knows all the short-cuts, where to look for the cause when troubles arise and how to remedy them.

He can tell you about CHATEAUGAY—"the iron that works wonders"—that produces the intricate, hard-surfaced, machinable, heat- and acid-resisting castings that may be difficult to obtain with ordinary iron.

Just ask us to send him whenever you need him.

REPUBLIC STEEL CORPORATION
General Offices: Cleveland, Ohio

Berger Manufacturing Division • Culvert Division
Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company

REPUBLIC STEEL — PRODUCTION FOR VICTORY

Republic

PIG IRON

"CHATEAUGAY"
Low-Phosphorus Copper-Free

"REPUBLIC"
(Northern)
Foundry, Basic and Malleable

"PIONEER"
(Southern)
Foundry and Basic

ALSO TRUSCON FOUNDRY FLASKS · REPUBLIC CORE WIRE · FOUNDRY NAILS

Unified Effort Would Aid Foundries Completing War Work Conversion

CONVERSION of industry to production of machines and supplies of war must be accomplished within the next few months if the threat of our enemies is to be thrown back. Unless our fighting forces can have the greatly needed ships, airplanes, tanks, guns, and every other type of war equipment in sufficient quantities to permit the United Nations to take the offensive, the conflict will be prolonged for many years, or the war may be lost. Upon the ability of our industry to convert completely and rapidly to war production depends the outcome of this war and the future existence of free men.

Early last year, the OPM developed the slogan "Time Is Short." Little did the government or the citizens of the country realize how short time really had become, or how great was the need for conversion to a war economy. As Donald Nelson, chairman of WPB, recently told the National Conference of Business Paper Editors at a Washington meeting, "We have wasted the golden months in which we could have got fully ready—the months in which we could have expanded our steel industry, our chemical industry, our copper industry, and all the others, so that we would have plenty of everything. But we still have ten silver months—the months which remain in 1942—and in them we can still do things that we never thought possible. The speed, energy, will and determination which we put into these months will determine what we will think when those months are gone."

The WPB is moving swiftly toward conversion to total war production of the larger establishments in various industries. Such smaller units as are deemed necessary will produce minimum requirements in essential civilian goods. But this policy, of necessity, must leave many plants in the medium and smaller classifications without either government or civilian work. These plants, and those holding prime contracts must see to it that subcontracting is pushed to the limit. The present war production problem is so tremendous that the government can do only a small part in spreading orders through all plants of an industry. Not only must more of industry be converted to the production of war goods, but industry must get more out of its present equipment by operating second and third shifts, in spite of the difficulties to obtain and train workers.

What is the situation in the foundry industry? If experience over the past year may be taken as a guide, demand for castings for war purposes will increase greatly as production gains momentum in the months just ahead. Therefore, conversion to meet this demand is one of the most pressing problems of the industry. But conversion is complicated because available facilities for producing the particular types and sizes needed for war already have been diverted to that purpose. Capacity which remains is not suitable, as it stands, to produce the needed castings of both ferrous and nonferrous metals.

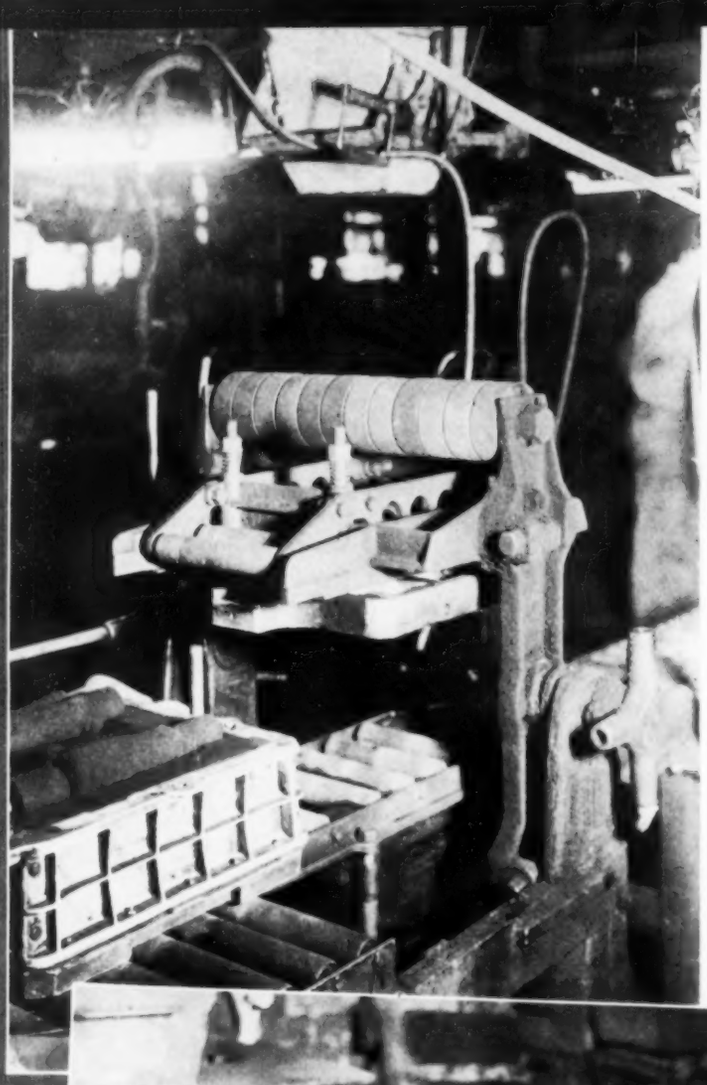
Steel foundries, including new plants and extensive additions now nearing completion, are engaged in war production, but the need for steel castings will be much greater. Heavy demand for machine tool and other machinery castings has absorbed most of the capacity of heavy gray iron shops so other sources of supply must be developed. Orders for malleable iron castings for defense work are increasing. While many nonferrous foundries are busy on war work and additional capacity for producing needed castings has been provided through new construction and conversion, additional capacity is available and should be employed by means of subcontracting.

Time is too short to build new capacity sufficient to produce indicated additional demands for the particular types of castings needed for war. Therefore, every effort must be made—with all branches of the industry co-operating—to utilize what is available. Need for unified control and co-ordination of facilities was never greater.

Frank G. Steinebach

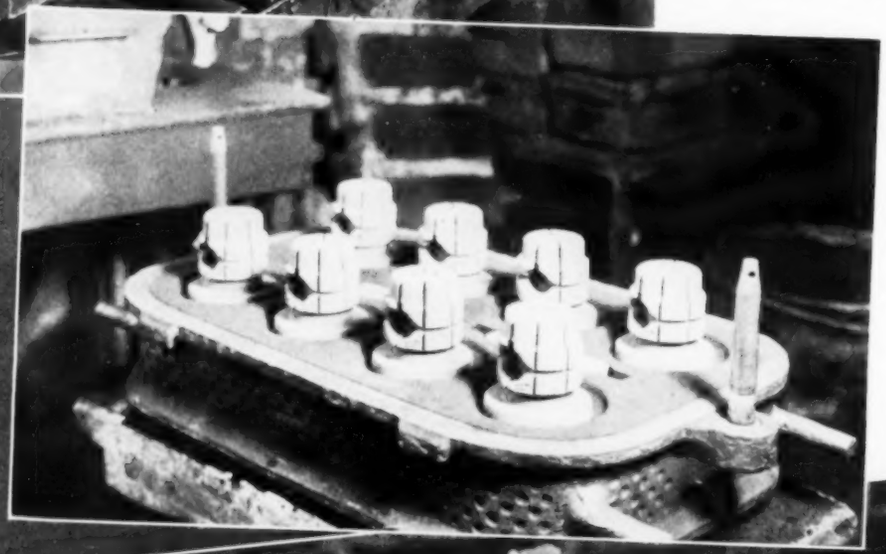
Editor

THE FOUNDRY—WHEREVER METALS ARE CAST



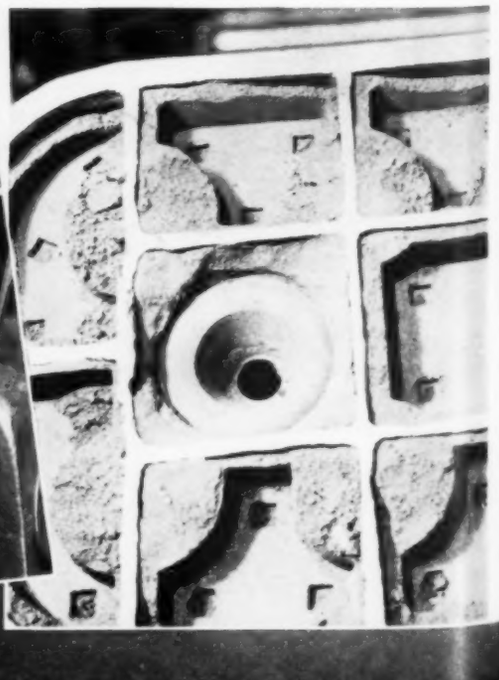
IN MORE than one instance clever and mechanically minded men have watched a dredge of the sand sucker type discharging a mixture of sand, mud and water into a land enclosure, natural or artificial. The water seeps back into the original body. The solid material remains to become an extension to the property. The sight has prompted several individuals to believe the same method might be employed to fill flasks with sand in the foundry. Early trials always showed that while sand lubricated with large volume of water flowed readily through a pipe, the same sand with a foundry moisture content between 5 and 10 per cent, and driven by compressed air, packed solidly in the pipe and refused to move.

Ask any foundryman, particularly a molder who handles the material, if sand in a damp and workable condition can be forced by air pressure through a small hole, or through a piece of small pipe. He will smile tolerantly or sourly, depending on his temperament, the time of day, his scrap percentage and the number of times he has been asked the same question by enthusiastic amateurs who think that the foundry in-



By Pat Dwyer

Blows



dustry is sadly in need of a shot in the arm or a good blood transfusion.

Without exception the answer from the man on the floor is a plain, unequivocal NO. Pressed for a reason he probably will counter with a question of his own: If sand can flow through little holes, how do you account for the fact that a man can ram sand in a flask in which the sides, ends and bottom plate contain a multiplicity of small and large holes? Why does the sand not flow out through all these holes and in modern phrase leave the molder holding an empty bag? Has the inquirer by any chance ever seen a poorly designed sand hopper over a molding machine where the sand packs so tightly by cohesion and gravity that it will not flow through the open gate at the bottom? Finally—with a fine air of superiority and dismissal—if it can be done, why is it not done?

Problem Solved Satisfactorily

If the party of the first part mildly claims that he has heard or read of an instance or maybe two instances where the problem has been solved satisfactorily, where green molding sand is driven under air pressure through a small opening and packed in a mold or core, the doubting Thomas will point out that a certain class of people always has been a natural push over for any kind of fantastic tale. Thank heaven, he concludes piously, he is not in that class. He will admit the job can be done when, with his own two eyes, he sees it done.

Visitors to an American Foundrymen's Association convention and exhibition in Philadelphia several years ago saw a machine of German manufacture blowing green sand into a mold. So far as filling the flask was concerned, the machine seemed to function satisfactorily, but apparently it lacked the necessary force to pack the sand to the required density. Also the volume of air required to operate the machine, precluded economical operation as compared with existing mechanical methods for ramming sand.

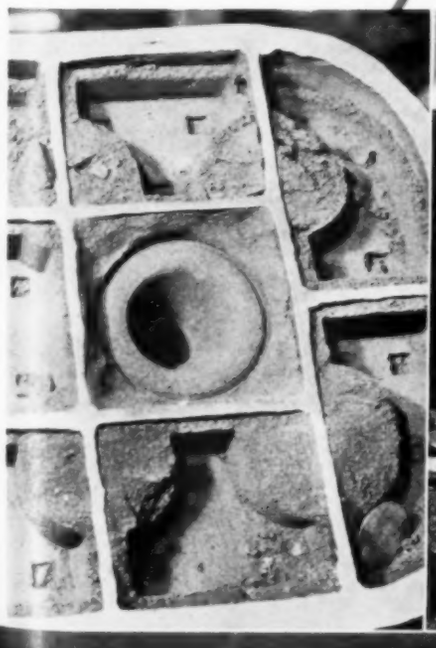
No Further Data Available

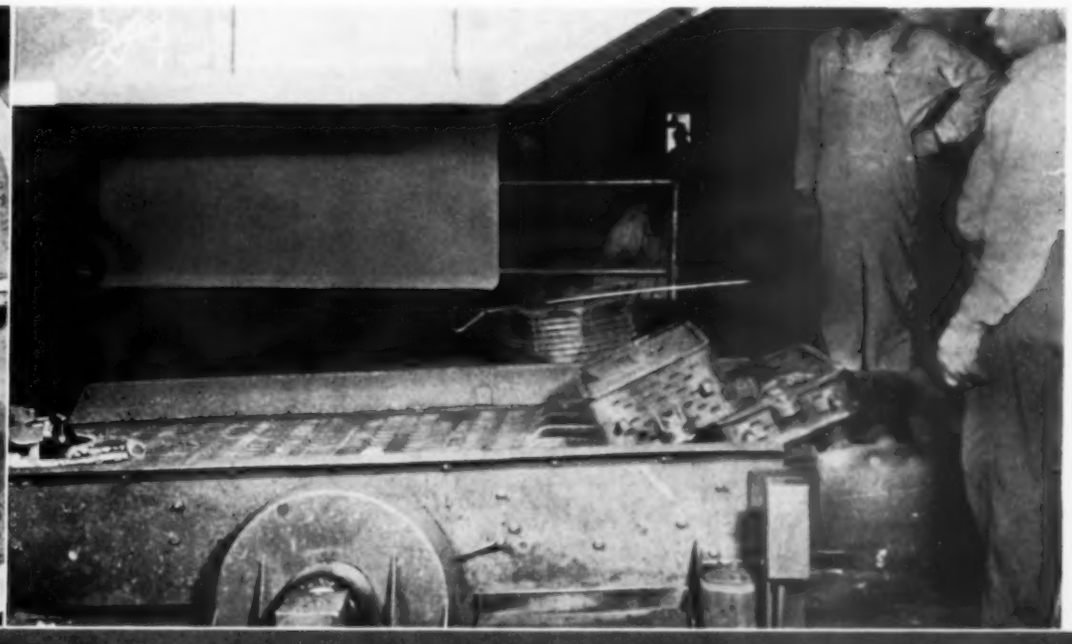
Illustrated description of a British invention and installation for blowing molding sand through a 1-inch diameter pipe for a considerable distance and with sufficient force to pack the sand properly in molds or cores, was presented in the Sept. 1940 issue of THE FOUNDRY. On account of the war and one thing and another no further details have been available since that time on the success or nonsuccess of the development.

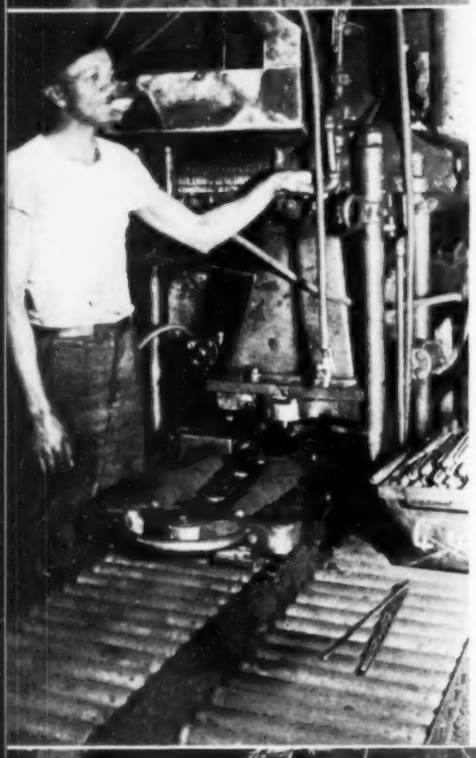
With the advent of the core blowing machine, foundrymen of an inquiring and pioneer type of

Fig. 1 (Upper left)—The drag is placed on the corebox and the assembly is rolled over on to a roller conveyor. Fig. 2 (Center left)—Dry sand piston cores are placed in the pattern plate and rammed up with the drag. Fig. 3 (Lower left)—Cores as they appear in the pattern plate. Fig. 4 (Center below)—Top of cope. Fig. 5 (Below right)—Shakeout.

Molding Sand into Cores







mind wondered if the machine could be employed to blow green molding sand into molds and cores. Some of these men experimented with the machine. Others merely turned the idea over in their minds at odd moments of relaxation, either by day, or while waiting for sleep to close their eyes at night. Actual operating problems and pressing duties during the day interrupted proper concentration on what was more or less a nebulous proposition.

Dog tired physically and mentally weary from top speed effort on the daily wrestling stage, the spark plugs on the mental engine fire sporadically and show a distressing tendency to lie down on the job, in the brief transition period between wakefulness and sleep. Desire for the late Mr. Shakespeare's sweet restorer, balmy sleep is more insistent and alluring than any desire to find an answer to a problematical and highly complicated question. With a sigh of resignation or despair, depending on the man's temperament, the subject is shoved into the pigeon hole marked unfinished business, to be taken up at some vague and indefinite period in the future.

In the light of the foregoing brief and general reference to a situation over a period of several years it is interesting to note that at the gray iron foundry of the Electric Auto-Lite Co., Fostoria, O., two core blowing machines made by the International Molding Machine Co., Chicago are employed in blowing green molding sand into cores. Encouraged by the success, a third and larger machine supplied by the same interest was installed some time ago for blowing sand into molds.

No figures are available for publication on the output of the core making machines, but it may be said that the cores from each machine are made at a speed to keep up with the molds made in the vicinity at top speed and placed on a moving conveyor. The cores are for sleeve type castings approximately 5 inches diameter and 14 inches in length. In one instance two cores are blown at each shot. In the other instance where the casting is somewhat larger and molded one in a flask, the cores are blown singly.

Sand for the cores is a mixture of lake and bank sand with permeability 60, moisture 5 per cent and green strength 8.

The process now developed to a high state of perfection in ease, precision and high speed of operation marks the completion of a long and at times discouraging series of experiments. Veteran W. W. Sherman, manager of the foundry division, Electric Auto-Lite Co., and William A. (Pat) O'Brien, foundry superintendent are justified in feeling a proper and legitimate pride in finding a way through a blind alley that has stymied many a practical foundryman. In addition to adapting the core blowing machine to handling green molding sand, highly ingenious auxiliary mechanical equipment also was designed, constructed and set up for handling the completed molds and cores. Several main features are shown in Figs. 1 and 7.

Copes and drags are made on two squeezer type molding machines set up in the space between a roller type conveyor and a plate type conveyor 200 feet in length on which the completed molds (*Please turn to page* 143)

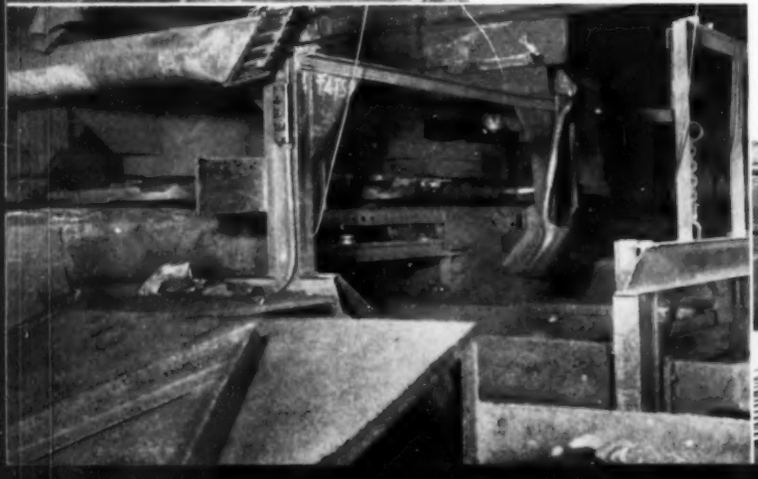


Fig. 6 (Upper left)—Signal lights announce tapping time. Fig. 7 (Center left)—Green sand cores reinforced with cast iron arbors. Fig. 8 (Left below)—Plow pushes molds from conveyor. Fig. 9 (Below)—Signal lights above superintendent's desk

Foundry Congress To Further Industry's War Effort

FOUNDRYMEN of America are aware that this is a war of production and that their industry, already playing a major part in the whole war program, is destined for an even greater role in the immediate future. To them this means one thing: Greater production, and the technical advancements necessary to attain their goal.

Around this theme the American Foundrymen's Association is building a vigorous program for the First Western Hemisphere Foundry Congress, and the Foundry and Allied Industries Show, to be held in Cleveland, April 20 to 24.

Offices of both the War Production Board and the Office of Price Administration will be established in the exhibit halls at Cleveland, manned by government representatives, where information on purchases, contracts and pricing of foundry products will be available without red tape. Under the WPB Materials division, the Priority sections on Foundry Tools and Equipment, and on Materials and Supplies, will maintain separate offices, with a third office covering Contract Distribution under the Production division. OPA will maintain two offices, one for its Nonferrous Castings section, the other for the Ferrous Castings section.

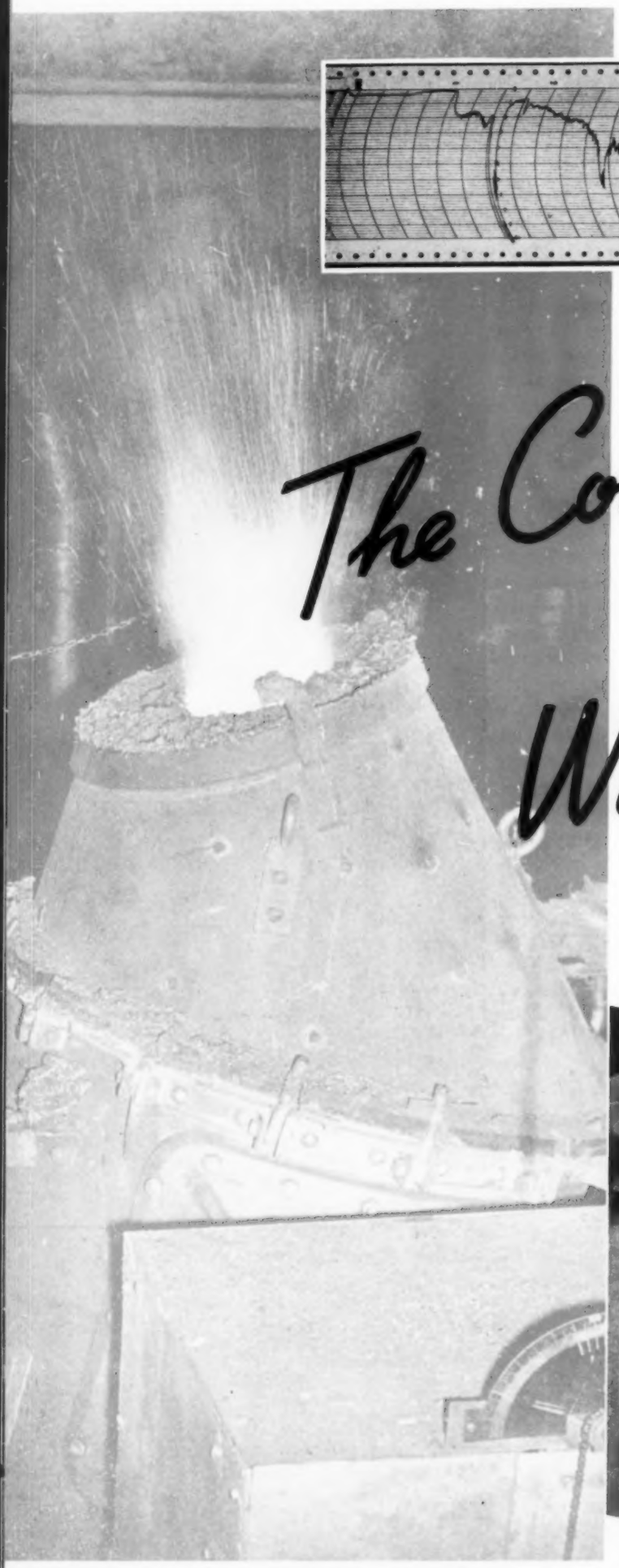
As a part of the government's program in developing more sources for the production of war materials, and better production in plants already engaged in such work, ordnance exhibits are to be sponsored by the Cleveland Post of the Army Ordnance association. These exhibits will stress the use of castings in war work by showing individual cast parts used in the assemblies of various types of equipment.

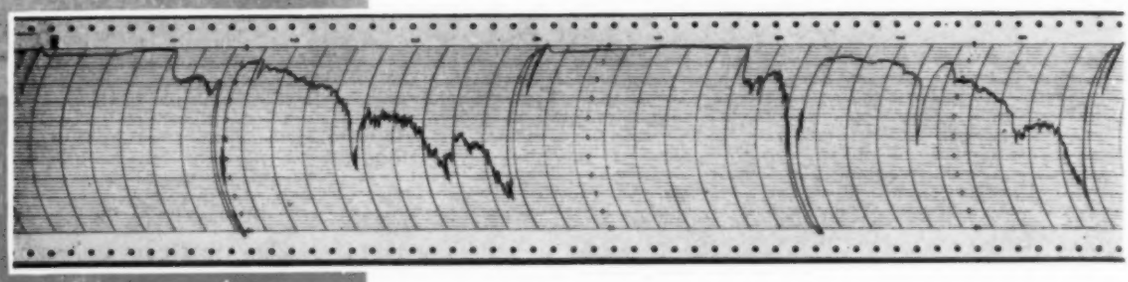
Other wartime activities of the government will be demonstrated in a number of displays, including an apprenticeship exhibit by the Department of Labor and exhibits by the Bureau of Mines and the Office for Co-ordination of Inter-American Affairs.

Some exhibitors are planning to demonstrate equipment designed specifically to increase production capacities, some are concentrating on the conservation of essential war materials, and others will show equipment built to withstand the rigors of high production schedules. Even firms now working at capacity and who cannot spare equipment for exhibit purposes, are planning to participate with displays of castings manufactured by users of their products, thus providing what might be termed "equipment clinics" for the diagnosis and cure of production difficulties.

With all thoughts turned toward present needs of increasing production and developing new methods in the foundry industry in order that this industry may play its part in the nation's war efforts, the major theme of the numerous papers to be presented before the 50 sessions of the First Western Hemisphere Foundry Congress will be "Production for Victory."

Notwithstanding the press of work falling on the members of the association, an unusually extensive and outstanding program of papers and reports has been arranged, indicating the extreme interest of foundrymen in getting together to pool their in- (*Please turn to page* 136)





The Converter's Place in War Production

By A. W. GREGG
Executive Engineer
Whiting Corp., Harvey, Ill.

IN THIS war of production, steel castings are indispensable in the production of tanks, guns, ships, ammunition and other implements of warfare. Reports indicate that present facilities are inadequate to supply the volume of steel castings needed in the limited time available. To meet this situation, a number of castings manufacturers have installed, or are considering installation of side blow converters as a means of expanding the production facilities for steel castings. In the past five years, over 30 converters have been installed, most of them since 1940.

Perhaps the two most important factors responsible for the converter's comeback are (1) the development of a practical means of reducing the sulphur content in the cupola metal; and (2) the development of electric eye apparatus to aid the converter operator in controlling the operation more accurately.

Reduce Sulphur Content

Inability to reduce the sulphur content in the cupola charge was at one time a definite drawback to the converter process. It meant the use of low-sulphur pig iron and scrap to keep within the allowed sulphur content in the finished product. This resulted in the converter foundry being unable to use its own gates and risers because of the sulphur buildup in the cupola. The introduction of the desulphurizing process for cupola metal, by treatment with alkalies in a receiving ladle, which is widely practiced today, removed the principal handicap of the converter. It is now possible to hold the sulphur content in the finished steel to 0.03 per cent or less.

Because of the ability to control the sulphur content it is now possible to use a much wider range of raw materials in the original charge. The proportion of pig iron and scrap can be varied greatly, depending upon the availability or cost of the one as against the other. The charge may even consist of nearly all steel scrap, plus a silicon-bearing alloy in amount necessary to supply the required percentage of silicon in the cupola metal.

Operation of the converter is no longer entirely dependent upon the eye of the operator. Since the development of electric eye apparatus, the end point of the blow can be determined to a split second, thus enabling the operator to control the operation with the greatest accuracy.

With the use of electric eye control, operators can be trained in a comparatively short period to produce quality castings with a converter. The acute shortage of trained steel men makes this a very important advantage.

Converter Presents Possibilities

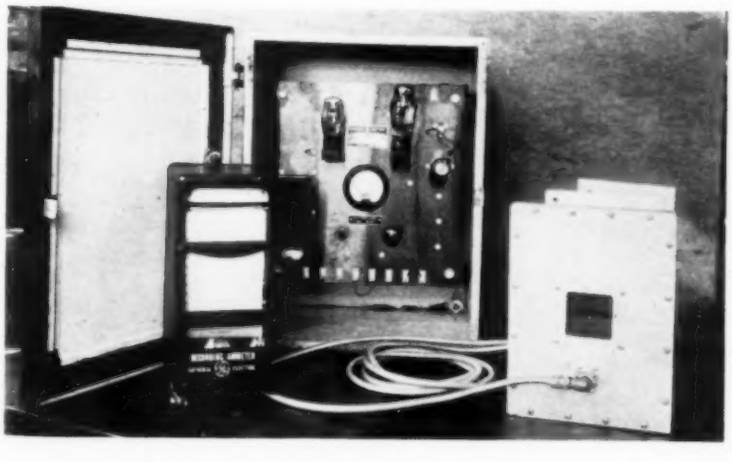
Flexibility of operation is a characteristic virtue of the converter process. It can be started up on very short notice and operated for a few heats or throughout the day, according to requirements. Metal is delivered to the pouring floor often and in small quantities, which makes for economy of floor space in the molding department. To make large castings it is entirely practicable to combine several heats in one ladle.

A well known company in the Chicago area has been using side-blow converters for many years to produce all steel castings used in its regular line of machinery products, and at the same time has supplied many tons of castings for ordnance purposes, strictly within the limits for chemical composition and showing about the following physical properties:

Tensile strength—75,000 to 80,000 pounds per square inch.
Yield point—42,000 to 48,000 pounds per square inch.
Elongation in 2-inch—25 to 30 per cent.
Reduction of area—42½ to 52½ per cent.
Cold bend—140 to 180 degrees.

Incidentally, this company has never lost a blow of converter steel used for ordnance work for failure to meet either chemical or physical requirements.

Like other steel- (*Please turn to page* 159)



Far left—Converter in operation blowing a heat of steel. Top left—Section of a chart from the electric eye recording equipment. Lower left—Converter operator following the blow both with the electric eye and visually. Below—Close up of electric eye control equipment

Data on Converter Operation

	Cupola: Cold Charge into Cupola Per Cent	Cupola: Hot Metal from Cupola Per Cent	Ladle Change Per Cent	Converter: Hot Iron to Converter Per Cent	Converter: Hot Steel from Converter Per Cent
Carbon	0.25 to 3.50	2.75 to 3.35	0	2.75 to 3.35	0.05
Sulphur	About 0.05	About 0.10	—0.07*	0.03	0.03
Manganese (Low side preferred)	0.60 to 0.70	0.50	0	0.50	0.05
Silicon[1]	1.75 to 2.25	1.50 to 2.00	0	1.50 to 2.00	0.05
Phosphorus	Not over 0.04	0.04	0	0.04 Max.	0.04

*Sulphur removed in ladle by treatment with alkalies.
[1] Temperature of steel controlled by percentage of silicon in metal charged.

Collecting Pattern Shop Cost

By ALBERT E. GROVER
Cost Consultant
Berea, O.

PATTERN SHOP COST
Month of January, 1942

BURDEN

Depreciation	$ 260.00
Property Taxes	28.16
Property Insurance	11.03
Power	142.10
Air	30.76
Maintenance & Repairs	50.51
Supplies	231.80
Supervision	225.00
Clerical	110.00
Employee Taxes & Insurance	74.16
Indirect Labor	137.18
Share of General Office	274.90
Total Burden	$1575.60

PRODUCTION COST

	Materials	Time	Labor	Burden	Total
New Patterns	$ 875.10	466.0	$ 467.80	$ 372.80	$1715.70
Rebuilt Patterns	10.75	85.1	88.64	68.08	167.47
Old Patterns Repaired	184.02	74.6	73.10	59.68	316.80
Flasks & Bottom Boards	678.40	578.2	404.74	462.56	1545.70
Maintenance & Repairs					
Melting		8.6	5.16	6.88	12.04
Core Making	65.10	178.2	176.41	142.56	384.07
Molding	110.40	330.0	331.37	264.00	705.77
Barrel Cleaning	50.00				50.00
Other Cleaning	8.15	84.0	75.60	67.20	150.95
Pattern Shop	4.65	10.1	9.09	8.08	21.82
Crane		22.8	23.16	18.24	41.40
Miscellaneous—Foundry	110.00	116.4	104.76	93.12	307.88
—Office		15.5	12.40	12.40	24.80
Total Production Cost	$2096.57	1969.5	$1772.23	$1575.60	$5444.40

MOLDING BURDEN

Depreciation	$
Property Taxes	
Property Insurance	
Power	
Air	
Old Patterns Repaired	$ 316.80
Flasks & Bottom Boards	$1545.70
Maintenance & Repairs	$ 705.77
Supplies	
Supervision	
Clerical	
Employee Taxes & Insurance	
Indirect Labor	
Crane Cost	
Share of General Office	
Total Burden	$

DEFERRED CHARGES
Pattern No. A 7643 Distribute over 1000 Castings

	Date	Castings	Charged	Def'd
Production Cost	1/5/42	1000		$ 500.00
	1/8/42	100	$ 50.00	$ 450.00

PURCHASED MATERIALS

STOCK MATERIALS

JOB TIME CARDS

SHIPMENTS
Month of 194

Day	Pieces	Order No.	Sales	Metal Cost	Labor Cost	Burden Cost	Pattern Cost	Total Cost	Profit
1	100	1435	$ 1,000.00	$ 200.00	$ 300.00	$ 400.00	$ 50.00	$ 950.00	$ 50.00
	50	1567	1,000.00	150.00	350.00	460.00	10.00	970.00	30.00
	1	1569	20.00	4.50	5.00	7.00	15.00	31.50	—11.50
	300	1682	2,400.00	450.00	600.00	900.00		1950.00	450.00
2	Etc.								

Data by Separate Jobs

IN MANY foundries the operation of a pattern shop is of sufficient importance to maintain a system of collecting cost data by separate jobs, and the allocation of the costs of those jobs to customers and departmental expenses in accordance with the activity causing the costs. Often activities in the pattern shop cover the maintenance of buildings and equipment as well as the regular work on patterns.

Outlines Cost Method

The following represents a sensible procedure for cost keeping in a pattern shop engaged in:

(a) Making new patterns.
(b) Rebuilding patterns.
(c) Repairing old patterns.
(d) Building flasks and bottom boards.
(e) Maintaining and repairing buildings and equipment.

Costs are divided into:

(a) Direct materials.
(b) Direct labor.
(c) Burden (often termed overhead).

Direct materials either may be purchased expressly for a specific job or the materials may be taken from stock maintained by the company for use on several jobs. In either case the cost of the materials are charged to classes of work as indicated by items 1 and 2 on the chart.

Direct labor is the wages of employes while engaged in:

(a) Making new patterns.
(b) Rebuilding patterns.
(c) Repairing old patterns.
(d) Building flasks and bottom boards.
(e) Maintaining and repairing buildings and equipment.

While it might appear that some of this labor should be treated as indirect labor and charged directly to the department receiving the benefit therefrom, it is really direct labor when considering the pattern shop as a producing department as it is here treated. For example, a molding machine is repaired in the pattern shop (in this foundry the millwright work is done in the pattern shop) and the labor is charged to the molding department burden, but not until after its share of the pattern shop departmental burden has been applied to it.

If this procedure is not followed, the cost of using the pattern shop operating facilities for this repair job would be included unjustly in the other pattern shop jobs. Also the molding department would not be charged with the true cost of making the repair. Suppose this repair job were sent out to another company, the molding department would be charged with *its* labor and a share of *its* (*Please turn to page* 140)

Form No. 1

WORK ORDER

DATE—January 15, 1942 ORDER NO.—1478

DETAILS

Make wood pattern and core boxes as per blue print attached.
Have promised delivery in ten days.
Advise them when completed and they will call for work.

ORDERED BY—(Salesman)

APPROVED BY—(General Manager)

WORK COMPLETED

CHARGE TO

Account	Pattern No.	Customer	Date	By
51	A-14825	The Machinery Company	1/23/42	(Foreman)

Form No. 2

WORK ORDER

DATE—January 1, 1942 ORDER NO.—1395

DETAILS

Repair or replace such flasks and bottom boards as need for production.
This order in force until December 31, 1942.

ORDERED BY—(Molding Foreman)

APPROVED BY—(Superintendent)

CHARGE TO

Account	Department

Foundries Gird to Meet War Demands

Developments Present Many Problems To Gray Iron Foundrymen

By GARNET P. PHILLIPS

Chief Metallurgist, Automotive Foundry Division
International Harvester Co., Chicago

DEVELOPMENTS during the past year have presented many problems to the gray iron and alloy gray iron foundrymen. Increasing restrictions on pig iron and increasing difficulty in obtaining adequate supplies of scrap iron and steel, coupled with the relatively high price of scrap as compared to pig iron, has resulted in greater use of briquetted iron borings and steel turnings—and in some instances in reduction of tonnage melted.

Restrictions on the use of alloys has caused the development of substitute alloy combinations. Copper-chrome alloy iron truck brake drums and hardened cylinder liners and sleeves for gasoline and diesel engines are examples of substitutes for nickel-chrome alloy gray irons. With restrictions on copper, further substitutes are being tested and have been tested in anticipation of this curtailment. Restrictions on nickel and copper have stimulated the use of special silicon ferroalloys and the use of molybdenum very markedly.

In the melting department if greater speed and economy are wanted the use of hot-blast equipment is finding favor where tonnages are large enough to justify installation costs. Mechanical charging equipment with greater tonnage capacities and elimination of hard manual labor are being used increasingly. Electric furnace melting for special irons has increased.

Core blowing equipment has been used for more and larger cores at reduced cost. Automatic controls on core baking equipment and im-

This is the second series of comments from leaders in the foundry industry which originally were prepared at the request of the editors of Steel for presentation in the Yearbook of Industry of that publication. Because of the widespread interest in past and future trends within the industry as gaged by men in the plant and laboratory, comments are presented in THE FOUNDRY. The first series appeared in the February issue.

The Editors

OEM Defense Photo by Palmer

proved types of ovens have increased core production and improved uniformity of cores.

There are possibilities of further restrictions, due to shortages, on practically all alloys normally used in alloy gray irons. This will further stimulate research on substitute materials and improvements in design of castings.

Note Increasing Demand for Special Products in Malleable Industry

By ENRIQUE TOUCEDA

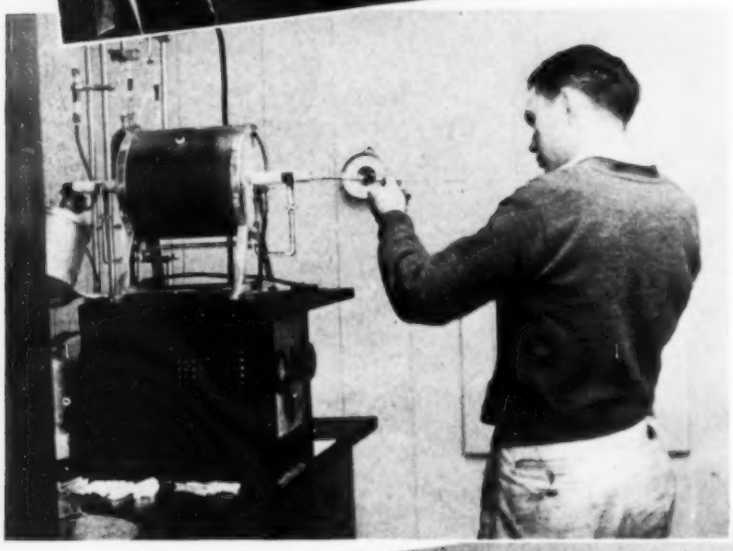
Malleable Founders' Society, Cleveland

WHILE there have been no recent new developments in either the melting or annealing practice in the malleable iron industry, there have been along the lines of special products and substitutions for which there is an increasing demand. In connection with the former, special products have been developed that have shown a very satisfactory degree of wear resistance accompanied with high tensile properties, while in connection with the latter, malleable iron is being substituted for brass in a number of applications.

For example, malleable iron is to be substituted for brass in the case of the male and female parts of the expansion type hose coupling for the 2½-inch diameter hose for civilian defense, and from reliable sources it seems certain that an order will be placed for 50 million feet of the 2½-inch diameter hose which will require one set of couplings for every 50 feet of hose. Couplings also are to be made for the 1½-inch hose. Owing to the scarcity of aluminum, there is a fair chance that pistons made of malleable iron will be substituted for aluminum in the case of the diesel engine.

Covering defense work many different malleable iron castings are now being used, namely: On the midget reconnaissance cars; armored army scout car; army tractor; army field range; army aviation gasoline truck; and in mortar construction, while a few malleable iron castings are used on bombers and light aircraft.

It can be stated that the case with which the malleable iron castings can be machined, their higher rust resistant (*Please turn to page* 149)



Training

By H. R. McCOY
Chief Metallurgist
Ohio Steel Foundry Co., Lima, O.

IN THE previous article which appeared in the February issue some procedures relative to laboratory manipulations as taught to the apprentices were described. Since there are many of those in which a thorough grounding is necessary to insure accurate results, the description of them are continued in this article.

In all precipitations the reagent should be added slowly, with constant stirring, and should not be hot when circumstances permit. The slow addition is less likely to occasion contamination of the precipitate by the inclosure of other substances which may be in solution, or of the reagent itself.

For complete and careful cleaning of precipitates from vessels during filtering, etc., it is often necessary to rub the sides and bottom of the vessel with a *rubber policeman* on the end

Apprentices In the Laboratory

of the glass stirring rod. All stirring rods should have ends rounded in the flame to avoid scratching the beakers.

Use distilled water in all quantitative analyses and in wash bottles. Funnels for filtration should have an angle as near 60 degrees as possible with narrow stems about six inches in length. The filter paper should be accurately folded to fit the funnel and placed so that the top of the filter is about ¼ to ½-inch below the top of the funnel. Filter paper should never extend up beyond the edge of the funnel as it will then be impossible to wash it thoroughly clean.

Test the filter by filling it with distilled water. This should fill the neck completely, forming a continuous column of liquid, which by its hydrostatic pressure produces a gentle suction, thus filtering rapidly. The tendency for precipitates to pass through filter papers when vacuum pumps are used is one objection to the use of that practice.

Support Filter Paper

Hydroxides of chromium, aluminum, or iron and silicic acid are exceptions and when suction is applied the point of the filter paper must be supported by a perforated platinum or tantalum cone. Gooch filters of asbestos are recommended as a substitute for filter papers for precipitates of a sticky or gelatinous character.

When the filtrate is received in a beaker, the stem of the funnel should touch the side to avoid loss by spattering. Neglect of this precaution is a frequent source of error. To save time in washing dense gelatinous precipitates much time can be saved by washing the precipitate by decantation. This is done by pouring the filtrate through the filter without disturbing the precipitates, and then pouring in another volume of fresh distilled water over the precipitate in the bottom of the beaker.

The beaker then is agitated gently, allowing part of the precipitate to settle. The liquid is filtered off and the operation is repeated two or three times until the precipitate left in the beaker becomes less dense. The remainder of the precipitate is transferred to the filter with as little wash water as possible, the filter containing the precipitate is washed and the filtration completed in the usual manner.

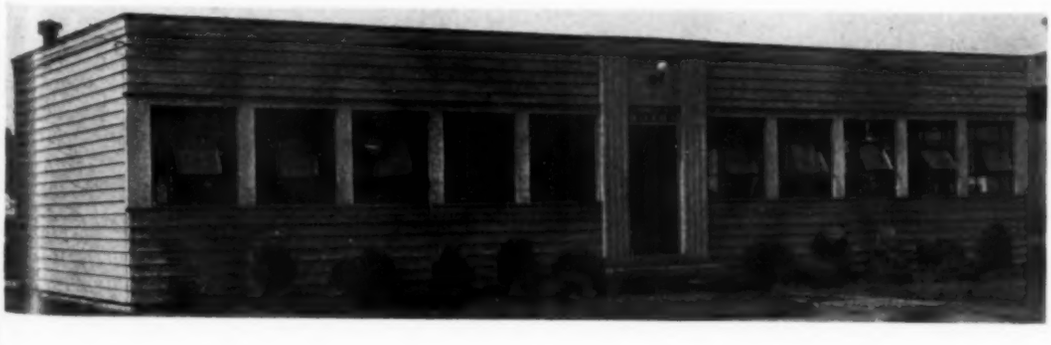
A precipitate should never fill the filter completely and wash water should always be applied to the top edge of the filter above the precipitate. Fill the filter up to the top of the filter paper with wash water each time in case the filtrate is to be thrown away as this will wash the filter more quickly. If a precipitate is to be washed with the least possible volume of wash water the latter should be applied by dropping it around the top edge of the paper in repeated small drops.

Gelatinous precipitates should not be allowed to dry before washing them completely. If they are permitted to dry and shrink or crack it is practically impossible to wash them clean of filtrate.

Washings Should Be Tested

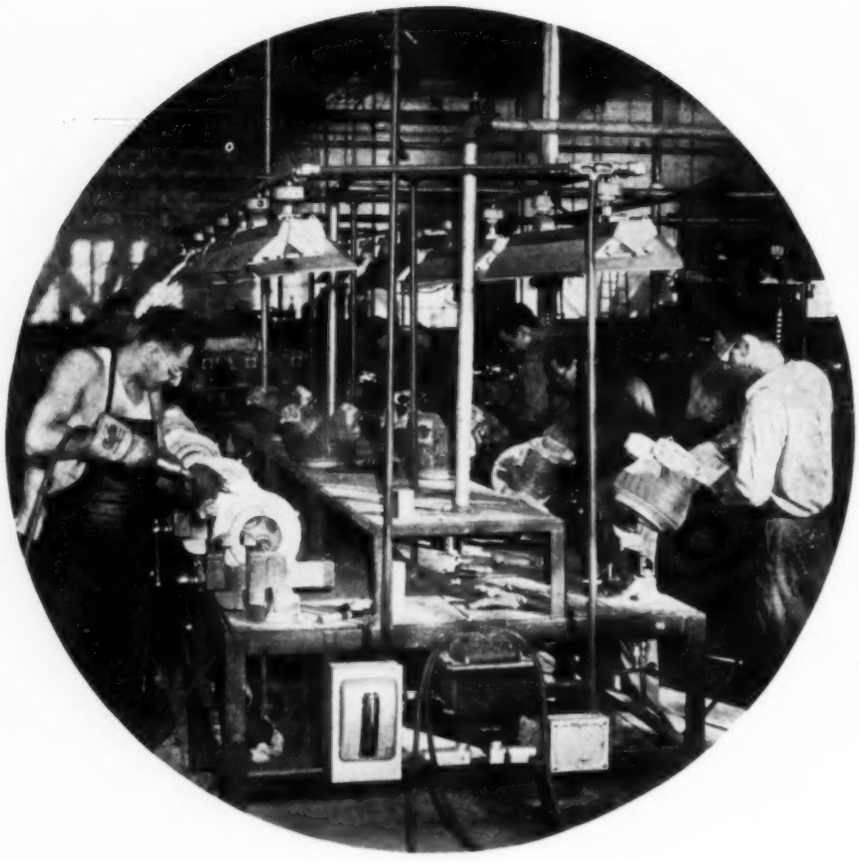
If in doubt as to whether the precipitate is properly washed, the washings should be tested, and washing should proceed until filtered precipitates are clean BY TEST.

Many precipitates may be ignited without previous drying. A partially dried precipitate requires more care, perhaps, than a wet one. The precipitate, with the filter carefully folded over it, should be placed in the bottom of the crucible and a small (*Please turn to page* 153)



Views at exereme left show various operations which the apprentice performs as he advances through the training course such as hardness determinations (top); carbon determinations (center), and metallography (bottom). View at left is the laboratory where training is conducted

PLANNING THE NONFERROUS FOUNDRY



By N. K. B PATCH

CONSTRUCTION of the foundry building itself, and the core room and its relative location have been considered in previous articles. A third division of the foundry that needs careful planning and arrangement is the cleaning room or snagging room as some foundrymen call it. After castings have been produced in the foundry they are delivered to the cleaning room where gates, risers and sprues, fins, etc., are removed and in many instances cores must be removed.

Study Flow of Production

Consequently the cleaning room must be located where the castings after shaking out from the molds may be delivered with a minimum amount of time and labor expenditure if the most economical practice is to be insured. Therefore, in planning the foundry, a designing engineer will do well to consider the flow of production from the point of receipt of raw materials in the form of metals to be melted right through to the delivery of the completed casting to the shipping department or to the machine shop if this is to be a captive foundry.

In considering this flow of production the fact that the castings after being shaken out must travel through the cleaning room with an economical expenditure of labor and time means that the cleaning room must be located conveniently and the means of transportation of the product to cleaning room must be the most economical design. If best results are to be secured the type of product must be planned for at the time of the designing of the buildings and equipment.

If small castings, then they must be handled in multiples and consequently in containers either moved by trucks or on over-head carrying systems. They should be delivered to the cleaning room at a point which is provided for the first step in the cleaning process and thereafter proceed along a planned and more or less scheduled procedure that will insure the minimum handling for each of the different steps in the process of cleaning. (*Please turn to page* 146)

Directing WAR PRODUCTION in the FOUNDRY INDUSTRY

AS CONVERSION to war production increases in intensity, the various branches of the foundry industry are finding that most controls of manufacturing operations center largely in Washington. Due chiefly to raw materials shortages, the production of castings is being further restricted to demands of war agencies. Procurement of materials utilized by the industry now is governed almost entirely by various orders issued by the War Production Board, the Office of Price Administration and other agencies.

Organizations and groups in Washington concerned with the problems of the foundry industry fall generally into the following three classifications: 1—Civilian organization; 2—War Production Board and Office of Price Administration; 3—Army, Navy, Maritime Commission and other agencies actually purchasing materials directly or indirectly related to the promotion of the war.

In the civilian classification, the Gray Iron Founder's Society, with offices at 1719 K street, N.W., Washington, operates as a contact medium between its members and the various departments of the government. W. W. Rose, executive vice president of the society directs the work of the society in Washington. Many of the benefits of this activity have extended far beyond the society membership to the entire gray iron branch of the industry. Greater support through increased membership in the society would permit a further enlargement of this excellent service at a time when it is greatly needed.

Since many units, sections and branches within the WPB and the OPA are concerned with problems pertaining to the foundry industry, THE FOUNDRY has prepared a partial list which should aid foundrymen in dealing with Washington, either in person or by correspondence. These various units, sections and branches are concerned chiefly with the distribution of the machines and materials utilized in the foundry, with providing sufficient capacity to meet war needs for castings, and with conversions.

Steel Castings
GEORGE F. HOCKER Chief, Forgings and Castings Unit, Iron and Steel Branch, Room 2537 Temporary Building R. ARTHUR K. READING, Assistant, Room 2539 Temporary Building R

Gray Iron and Malleable Iron
W. S. SHIFFER, Chief, Iron Products Section, Iron and Steel Branch, Room 2545 Temporary Building R. (This section handles gray iron, malleable iron, cast iron pipe, pressure pipe, soil pipe, culvert pipe and fittings)

Foundry Equipment and Supplies
W. R. BEAN, Chief, Foundry Equipment and Supplies Unit, Room 4047 New Social Security Building

Heat Treating Equipment
BRADLEY STOUGHTON, Chief, Heat-treating Equipment Unit, Room 4514 New Social Security Building

Cranes
SYDNEY BUCKLEY, Chief, Crane Unit, Room 4514 New Social Security Building

Pig Iron
WILLIAM KERBER, Head, Pig Iron Unit, Raw Materials Section, Iron and Steel Branch, Room 2633 Temporary Building R. J. H. BEMIS, Assistant, Room 2633 Temporary Building R

Scrap
ALEX MILLER, Head, Scrap Iron Unit, Raw Materials Section, Iron and Steel Branch, Room 2627 Temporary Building. R. L. J. BORENSTEIN, Consultant, Scrap Iron Unit, Room 2629 Temporarly Building R

Refractories and Fluxes
DON N. WATKINS, Head, Refractories and Fluxes Unit, Raw Materials Section, Iron and Steel Branch, Room 2634 Temporary Building R

Fuel
EDWARD HOLLEY, Head, Fuel Unit, Raw Materials Section, Iron and Steel Branch, Room 2642 Temporary Building R

Metallurgy
GEORGE B. WATERHOUSE, Chief, Metallurgical Section, Iron and Steel Branch, Room 2603 Temporary Building R

Aluminum and Magnesium
FRANK B. CLIFFE, Assistant Chief, Aluminum and Magnesium Branch, Room 2013 Temporary Building R

Copper and Brass
H. W. DODGE, Chief, Copper Branch, Temporary Building R

Prices—Office of Price Administration
Iron and Steel Scrap—E. A. FRANCE JR., Temporary Building D
Iron and Steel Castings—J. E. MCDONOUGH, Temporary Building D
Pig Iron and Coke—DEXTER TITEIN, Temporary Building D
Brass and Bronze Castings—J. H. LAYHEW, Temporary Building D
Aluminum and Magnesium—E. STANLEY GLINES, Temporary Building D

Actual application of castings to war production rests with many individuals and groups in practically every war agency in Washington, including the War Production Board, Navy, Army, Air Corps, Maritime Commission and Civilian Defense.

QUESTIONS and ANSWERS

Yellow Brass Castings Contain Hard Spots Which Ruin Tools

We are sending two samples of yellow brass castings made from scrap melted and run into ingots. They have spots in them that ruins the threading tool. Castings are made on a squeezer from plated patterns. The brass is melted in an oil burning furnace, we tried a reducing flame and also an oxidizing flame, but neither seemed to help. We bring the metal up to 2250 degrees Fahr. skim and pour at 2100 degrees.

Two of the samples submitted indicate the presence of aluminum while the third does not. That suggests that apparently there is some considerable variation in the formula from which these castings are being made. Under present metal conditions due to the defense demands there is a considerable difficulty in getting the pure metals, zinc, copper or aluminum, and scrap likewise is being allocated or controlled by priorities. This may explain the variation in the skin surface of the castings submitted.

You say nothing of how these castings were gated and nothing as to whether the flasks are poured on the incline or the flat. Obviously, such thin castings must be cast so that the metal flows up hill and enters the mold rapidly enough to fill before it becomes too sluggish. Therefore, it would seem to be desirable to have at least two entrance gates well supplied with an ample flow of metal and have these gates located at the lower side of the mold, the mold being inclined so that the metal flows up hill from the entrance gates. This should reduce your difficulty materially.

If these castings will serve the purpose with a small percentage of aluminum present, say not to exceed 0.2 per cent and preferably only about 0.1 per cent, that quantity would give an aluminum oxide envelope over the entire surface of the metal which would reduce drossing materially. However, the metal must be skimmed thoroughly before pouring. One of the castings submitted has tangled in the edge a chunk of slag the size of a good sized pea; indicating improper skimming or at least careless pouring which would account for a considerable amount of trouble of many kinds.

It might also be to your advantage to increase the amount of stock on the surface to be threaded which would permit of the removal of the first defective surface and thus leave good sound metal on which to cut the thread. This would compensate for some of the difficulties that are inherent in yellow brass. It is generally conceded that the saving in the cost of the metals in using yellow brass is sometimes wasted in defective castings as compared with making the same castings in a cheap red brass. The temperature at which you are pouring appears to be about right although 25 to 50 degrees higher might help a little if the metal is well skimmed each time it is poured. The sand must be worked as dry as molding conditions will permit and should be fairly open so that venting is free. One of the castings submitted suggests the possibility that the sand might have been a little on the wet side.

Production of Manganese Steel Requires Long Experience

What is the present practice for the production of manganese steel, and what is the method of quenching? Is the converter being used to produce the steel, or the electric furnace?

Manganese steel, containing from 11 to 13 per cent manganese is today usually produced in the electric furnace. A basic lining is essential, if the heads, gates and scrap castings are to be remelted, as they should be for an economical operation. In a basic lined furnace, the manganese steel remelt, carbon steel, scrap and the necessary amount of ferromanganese can all be melted and brought to proper temperature, with but a slight loss of manganese.

If only an acid lined furnace is used, a heat of low carbon steel is made up and brought to temperature, the required ferromanganese is melted in a separate melting unit, and the two combined by pouring the low carbon steel from the electric furnace into the melted ferromanganese, in the ladle. The scrap from previous heats cannot be melted in the charge. Some makers of manganese steel still use the sideblow converter, and a small amount is also made from open hearth steel. As in the case of the acid electric furnace, the manganese steel scrap from previous melts cannot be incorporated as part of the charge. In operating by these methods, low carbon steel from the converter or from the open hearth ladle is poured on

top of the necessary amount of ferromanganese, in a ladle. If the open hearth steel from one ladle is to be transferred to a second, smaller ladle, a rather large nozzle should be used, to prevent undue loss of temperature of the steel.

The method of quenching for 11 to 13 per cent manganese steel is to bring the castings to a temperature slightly above 1900 degrees Fahr. and quench them in a large tank of water, without allowing the temperature of the castings to fall too far below 1900 degrees before they actually go into the water. No further heating is permissible, after the quench.

There are many features of manganese steel production that require experience not usually possessed by foundrymen familiar only with the manufacture of carbon and the usual alloy steels, if serious trouble and loss of castings is to be avoided. A foundry whose staff has had no experience with manganese steel production should not attempt to enter the field, without the guidance and assistance of a competent man familiar with the problems involved in the manufacture of this steel.

Gives Information on Making Aluminum Matchplates

We have used a fine grain sand on flat aluminum castings, and the faces of the castings have showed up with hundreds of small dents like small punch marks. Could that be caused by using a sand that is not fine enough? Is there some kind of flux or facing to shake on the mold to produce a smooth surface. Since we cannot get any new ingot metal we are using all scrap aluminum. Which is preferable, to air dry or flame dry the face of a matchplate mold? Should gaggers be set with the shank against the back of the bar and the toe projecting underneath the bar, or in the usual manner with the shank against the front of the bar? We have made a few matchplates but will appreciate further information.

From the fact that you already have made some aluminum matchplates, we assume that you are fairly familiar with all the general foundry practice involved. Practically every method, including the manufacture of matchplates, is described in several chapters of the book "Tales From The Gangway," published by the Penton Publishing Co., Cleveland. Any fairly fine sand will serve satisfactorily. Windsor Locks sand is employed on fine intricate designs, but is not necessary on the majority of castings. Sand of any kind is worked drier and rammed more gently on aluminum than on iron castings. The pock marked face on the casting is caused by excess moisture in the sand.

The sand for aluminum castings should be worked on what a molder would term the dry side. Where a measuring instrument is available this means 3 to 4 per cent. Facing is not necessary on molds for aluminum castings. Temperature of the metal usually is between 1200 and 1300 degrees Fahr. Scrap aluminum is quite suitable for matchplates. In certain instances it is optional or immaterial whether gaggers are set in front of or behind the cope bars. Where the bars fit the contour of the pattern closely, no option exists. The practically universal custom is to set them in front. The only really important feature of gagger setting—exclusive of hooked gaggers—is to see that the shank of the gagger in contact with the bar, is longer than the toe. For certain plates flame drying is preferable to air drying, but in the majority of instances neither type of drying the mold is necessary.

Gray Cast Iron To Be Made From Steel Scrap and Silicon

We are located in western Canada and understand that there will be a shortage of scrap iron before long. Hence, we would like to have information on a method of producing gray cast iron from a mixture of steel scrap, silicon and graphite.

You should have little difficulty in producing a wide range of gray cast irons from steel scrap if you will keep one thing in mind. That is—that steel scrap is low in such elements as carbon, manganese, and silicon which must be increased considerably to produce a suitable gray iron composition. As a general rule you need not worry about the carbon increasing to the desired range since melting steel scrap in the cupola permits absorption of carbon up to the saturation point for the particular silicon content involved.

Unfortunately, the silicon and manganese increase can not be obtained in that manner since those metals are not available in the coke as is carbon. Therefore, they must be added with the metal charge in the cupola or in the ladle. Silicon content may be increased by addition of high silicon pig iron, in the form of ferrosilicon, or as silicon briquets which are added to the metal charge. Ground ferrosilicon may be added to the ladle for the same purpose. Similarly, the manganese content may be increased through addition of high manganese pig iron, ferromanganese or manganese briquets to the metal charge, or by use of ground ferromanganese in the ladle.

The amount of the various materials mentioned to be added to the metal will depend upon the desired composition of the final iron. For example, the average silicon content of steel scrap is about 0.25 per cent while for your purpose the gray iron perhaps should contain 2.00 per cent silicon. Hence, in 1000 pounds of material charged into the cupola 17.5 pounds of silicon would have to be added. That could be accomplished roughly by the substitution of 200 pounds of 10 per cent silicon pig iron for a similar amount of steel scrap, or addition of 22 pounds of crushed ferrosilicon to the 1000 pounds of charge, or of 9 large size silicon briquets containing 2 pounds of silicon. If comparatively large ladles of good, hot iron are used the ferrosilicon in ground form could be added to the ladle. Incidentally, it probably would be well worth while to add part of the silicon in the cupola and part in the ladle.

You mention a mixture of steel scrap, silicon and graphite—but as far as we know, the graphite never is added in the cupola. In some foundries graphite is added to molten metal in the ladle to ameliorate or eliminate trouble from hard or chilled edges.

Thick Plates Made In Several Ways

We have several thick plates to make 5 feet square and 6 inches thick. Each plate will have 14 rows of 2-inch square holes, a total of 196 holes set 2 inches apart. In your opinion which method is preferable, to make the mold in dry sand, or to make the mold in a core assembly? Does the casting require to be fed through risers? The casting is to be machined only on the cope side.

This casting can be made in a green sand mold, a skin dried mold, a dry sand mold, or in a core assembly. Any of the four methods will produce a satisfactory casting if the mold is made properly. The method adopted will depend on several factors including class of help available, sand characteristics, type of floor or flasks, type of oven, style of pattern, the time limit on the order and the number of men assigned to the job. The core method presents a certain saving in labor cost, but this saving is offset by the cost of binder in the sand, and fuel in the oven. With every item included, the cost will be approximately the same, irrespective of which method is adopted. Since we are not familiar with all the conditions in the present instance we cannot offer a dogmatic opinion. The following brief reference to each of the four methods may assist you in arriving at a decision.

1. Green sand. Whether the mold is made in flask or a floor pit, a coke bed is placed in the bottom and covered with floor sand to a depth of four inches. This sand is tramped down and then covered with a 1-inch thickness of facing sand containing 10 per cent coal dust. This sand is vented with a wire down to the coke. The surface is scraped off flat and level with a straightedge riding on two other straightedges on opposite sides of the bed. This also closes the top of the vent holes. A light dust of facing is spread over the face with a No. 8 sieve and slicked with the trowel. The pattern is laid on the bed and rapped down lightly with a sledge hammer. The pattern then is staked at the corners and removed temporarily. The molder armed with a sprue cutter removes sand from the core prints to a depth in excess of the depth of the print. The pattern then is returned to place and rapped down until it rests on the bed. Sand is rammed around the four sides, a parting is made and the cope is rammed in the usual manner and lifted off. The pattern then is removed and the mold is finished, cored and closed. Sand is tucked and slicked around the cores, before the surface of the mold is blacked.

2 and 3—The skin dried mold and the dry sand mold are made in the same manner with the exception that no coal dust is used in the facing. Practically any type of core binder is added to the facing sand to impart added strength and prevent it from crumbling when the heat is applied. Plumbago or other commercial facing mixed with a weak solution of molasses or other soluble binder, is sprayed or brushed over the face of the mold. The mold is skin dried with a gas or oil torch, or with a charcoal or coke fire. The dry sand molds are dried in the oven.

4—The core mold may include a cope and drag, or a flat green sand cope may be substituted for the covering core. The drag and cope cores may be reinforced with rods or pipes, but cast iron arbors are more substantial. Also they save time and labor and may be used repeatedly. A row of dabbers is provided on the perimeter to reinforce the side walls of the drag core. A layer of coke is enclosed in the drag core to vent the core itself and to take the vent from the multitude of small upright cores. Vent from the small cores in the other type molds also is taken off through the coke bed. This extra precaution in venting is necessary to prevent any commotion in the metal. Commotion, boiling and kicking produce slag and dirt which lodge against the cope face.

To prevent cold shuts, streaks, bubbles and round corners, and to insure a clean casting, the best way to gate the mold is through a great number of small pop gates either round or flat. The cope side of the pattern is marked in squares to corespond with the position of the core prints on the bottom. Gates are arranged to drop metal in the open spaces between four cores. The gates, ¾-inch diameter or ¼ x 2 inches, are set up in three straight rows, one in the center, and one 15 inches distant on each side. A long narrow runner feeds each row on top of the cope. The three runners terminate in a basin at one side of the mold for reception of metal from the ladle.

If the mold is made in the floor a weight of at least 6 tons will be required to hold the cope down. If the mold is made in a flask, wood or iron, the bars must be braced over the center. For safety the core mold is assembled inside a flask, pit or curbing. The top center must be weighted or braced to resist the upward pressure of the metal. A flowoff riser at each corner will indicate when the mold is full of metal, will relieve the strain and will drain the surplus metal from the runner basins. Weight of casting is approximately 4500 pounds.

Tuyeres Are Poked Every Two Hours

We run an 8-hour continuous heat in a cupola lined to 48 inches. The bee hive coke bed is 40 inches high. The charge is half and half pig iron and scrap 1400 pounds; 180 pounds coke; 65 pounds limestone; 3 pounds fluorspar. All material is hand charged. Iron at a temperature of 2650 degrees Fahr. is melted at the rate of 6 tons per hour. The tuyeres equals 25 per cent of the cross sectional area. A control device delivers 2900 cubic feet of air per minute at a pressure of 11 ounces. The lining extends 2 inches in past the tuyeres and then tapers back to the 48-inch lining about 2½ feet above the tuyeres. The tuyeres have to be cleaned every 2 hours. We shall appreciate your opinion on our cupola practice and how to operate with not more than one tuyere cleaning per day.

The normal melting capacity of a 48-inch cupola is between 9 and 10 tons per hour. To attain this melting rate the volume of air, coke and iron must be proportioned properly. Thus your present supply of 2900 cubic feet per minute is not quite enough for a delivery of 6 tons per hour and is far short of 4500 cubic feet per minute required to melt 9 tons per hour. You do not state whether the 40-inch bed means 40 inches above the sand bed or 40 inches above the tuyeres. If the former, it is too low. The 65 pounds of limestone and 3 pounds of fluorspar is sufficient, if the limestone is high quality. You do not state if the cupola slags freely or not. The slag must run freely, especially on a long heat. On a short heat, disposal of the slag is not an important factor.

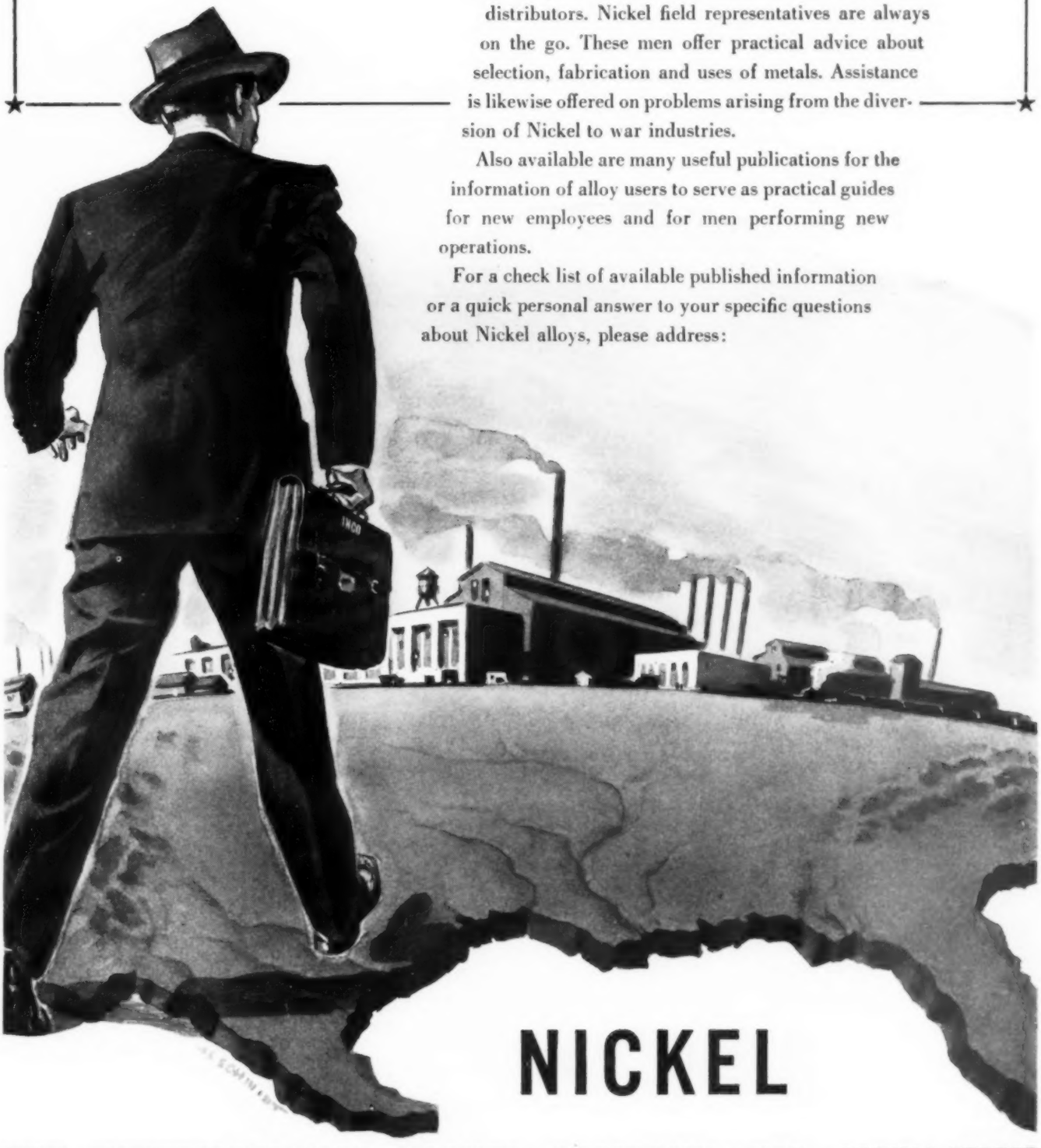
The tapping temperature, 2650 degrees is too low for light castings, unless you catch the metal in hand ladles a the spout. A low bed, heavy iron charges and thick splits of coke probably are responsible for the black tuyeres. We suggest you change your practice as follows: Raise the bed to 48 inches above the tuyeres, place 1000 pounds of iron and 125 pounds of coke on each charge. Light the fire early and let the contents of the cupola soak in the heat for about an hour before putting on the blast. If 6 tons per hour meets your requirements, your present blast equipment will serve. If you want to raise the delivery up to capacity, you will need a blower capable of delivering 4500 cubic feet per minute. For a proper understanding of cupola operation, read *Melting Iron in the Cupola*, by J. E. Hurst, published by the Penton Publishing Co., Cleveland.

ON THE MARCH to aid users of alloys...

FIELD offices are maintained by International Nickel's Development and Research Division and by qualified distributors. Nickel field representatives are always on the go. These men offer practical advice about selection, fabrication and uses of metals. Assistance is likewise offered on problems arising from the diversion of Nickel to war industries.

Also available are many useful publications for the information of alloy users to serve as practical guides for new employees and for men performing new operations.

For a check list of available published information or a quick personal answer to your specific questions about Nickel alloys, please address:



NICKEL

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

MEN OF INDUSTRY

MARTIN FLADOES has been elected president, Sivyer Steel Castings Co., Milwaukee, succeeding the late L. S. Peregoy. Mr. Fladoes began with the firm 22 years ago as an apprentice in the foundry. However, he did not stay in the foundry long since he preferred the business end of the work. After a few years in the office, Mr. Fladoes went on the road for the firm as a salesman, and it was not long before he was appointed sales manager of the company. In 1930, when Sivyer bought the Nugent Steel Casting Co., Chicago, Mr. Fladoes was made vice president in charge of sales for the Sivyer company. At that time he had been a director of the company for 3 years. Prior to joining Sivyer Steel Castings Co., Mr. Fladoes was active in the first World war, serving for a year and a half abroad with the Three Hundred and Thirty-third Machine Gun division. After the war he returned to the University of Wisconsin to graduate.

At the annual meeting, HAROLD L. HOLTZ, vice president, was elected to the board of directors.

♦ ♦ ♦

OLIVER E. MOUNT, secretary and treasurer, American Steel Foundries, was elected president of the Steel

Oliver E. Mount

Founders' Society of America, at a meeting of the board of directors of the society held at New York, Jan. 14. Mr. Mount was born in Petersburg, Tenn., and attended schools in that state, including business college in Nashville, and later Northwestern University, Evanston, Ill. From 1908 to 1909 he was employed in the general passenger department of the Nashville, Chattanooga and St. Louis railway, from 1910 to 1916 was with the United States Navy, and since that time has been connected with the American Steel Foundries.

Officers and directors elected at the meeting of the Steel Founders Society include: Vice president L. C. WILSON, Reading Steel Casting Division, American Chain & Cable Co., Reading Pa. who with Mr. Mount, and C. L. HARRELL, Sterling Steel Casting Co., East St. Louis, Ill., constitute the executive committee; directors, Mr. Mount, chairman; Mr. Wilson; D. P. MURPHY, Symington-Gould Corp., Depew, N. Y.; FRANK M. ROBBINS, Ross-Meehan Foundries, Chattanooga, Tenn.; C. W. HOWAT, Continental Roll & Foundry Co., Pittsburgh; F. K. DONALDSON, Machined Steel Casting Co., Alliance, O.; M. A. FLADOES, Sivyer Steel Casting Co., Milwaukee, Mr. Harrell; and N. K. ANDERSON, Alloy Steel & Metals Co., Los Angeles.

Alternate directors include E. M. SCHUMO, Pennsylvania Electric Steel Casting Co., Hamburg, Pa.; ELLIS HODGE, Erie Forge Co., Erie, Pa.; F. G. RUSSELL, Florida Machine & Foundry Co., Jacksonville Fla.; T. H. SHARTLE, Texas Electric Steel Casting Co., Houston, Tex.; T. F. DORSEY, Fort Pitt Steel Casting Co., McKeesport, Pa.; A. A. STROPPEL, Sawbrook Steel Castings Co., Cincinnati; CARL E. CLARKE, Monroe Steel Castings Co., Monroe, Mich.; L. J. WISE, Allied Steel Castings Co., Chicago; S. V. WOOD, Minneapolis Electric Steel Castings Co., Minneapolis; F. G. LANGBEIN, St. Louis Steel Casting Co., St. Louis; E. L. KNIGHT, Pacific Car & Foundry Co., Seattle; I. L. JOHNSON, Pacific Steel Casting Co., Berkeley, Calif.; executive vice president, COL. MERRILL G. BAKER, Cleveland; secretary-treasurer, R. L. COLLIER, Cleveland; technical advisor, C. W. BRIGGS, Cleveland.

A. WILLIAM SCHNEBLE JR., has been appointed metallurgical engineer of the Advance Foundry Co., Dayton, O. Mr. Schneble received a doctor's degree in metallurgy from Massachusetts Institute of Technology, and he will be in charge of metallurgical work at the Advance company.

♦ ♦ ♦

G. C. DICKEY recently was made general superintendent, Harrison Steel Castings Co., Attica, Ind. Mr. Dickey graduated from Purdue University, Lafayette, Ind., with a degree in mechanical engineering in 1915. At the university he was elected to membership in Tau Beta Pi, honorary engineering fraternity, and Sigma Xi, honorary engineering research society. During the last war he served 2 years with the Marine Corps and he was in the National Guard for 12 years. Mr. Dickey started with the Harrison Steel Castings Co. in the sales department in 1919. In 1936 he was made sales manager and held that position until 1938 when he became assistant to the general superintendent.

♦ ♦ ♦

HENRY A. CARTER recently was elected president and sales manager, Geneva Metal Wheel Co., Geneva,

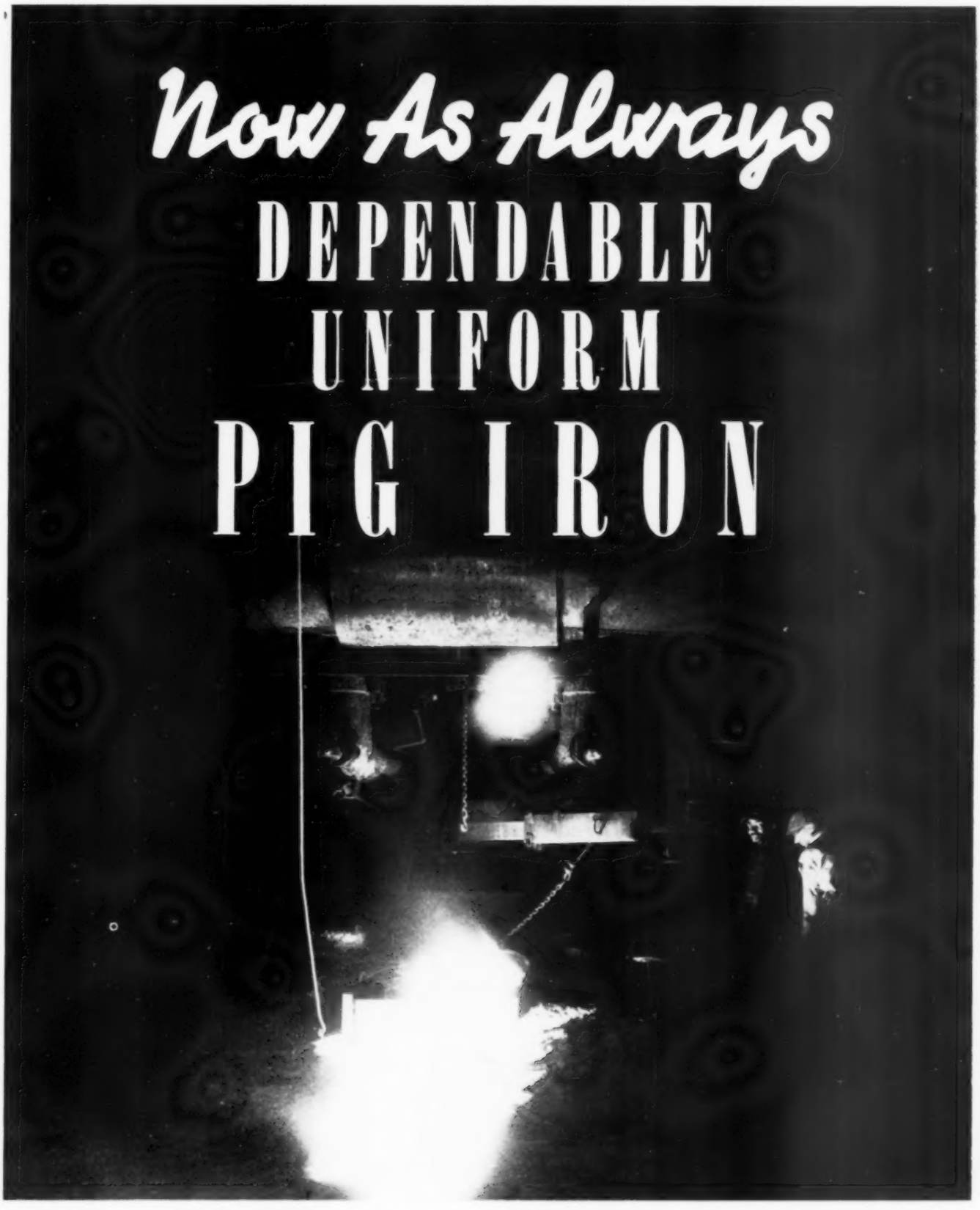
L. C. Wilson

O. A. M. FORD who has been president and treasurer resigned as president but remains as treasurer. Mr. Carter joined the sales force of that company in 1916. He is

(*Continued on page* 82)

Now As Always

DEPENDABLE UNIFORM PIG IRON



WOODWARD IRON COMPANY

WOODWARD, ALABAMA

America's Largest Completely Integrated and Entirely Independent Merchant Iron Producer

INDEPENDENT SINCE 1883

(*Continued from page* 80)

chairman of the Wheel Standardization Committee of the Caster & Floor Truck Manufacturers' Association and has played a prominent part in the development and promotion of various wheel products manufactured by the firm. He also was a chairman of the Defense Sub-Committee on Industrial Pneumatics of the Tire & Rim Association. Mr. Carter graduated from Purdue University, Lafayette, Ind. in 1911.

♦ ♦ ♦

HARMON S. EBERHARD has been appointed vice president, Caterpillar Tractor Co., Peoria, Ill. He will have administrative direction of research, engineering, manufacturing, industrial relations and training. He succeeds Thomas J. Connor, vice president, who died recently. Mr. Eberhard is a native of Stockton, Calif., and he entered the employ of the Holt Mfg. Co. in that city at the age of 16. During World War I he enlisted and served more than a year overseas. Upon his return to Stockton, Mr. Eberhard did special development work for the U. S. Ordnance Department and in 1925 transferred to the engineering staff of the Caterpillar company in San Leandro, Calif., becoming assistant general chief engineer in 1928, and chief engineer in charge of research in 1930. He went to Peoria and was made chief engineer in 1933.

G. E. BURKS, formerly assistant chief engineer in charge of engine design, has been appointed chief engineer. Mr. Burks is a native of Montana. He attended University of Montana for one year and then moved to California where he acquired his early engineering experience, continuing his studies through extension courses of the University of California. In 1928 he joined the engineering staff of Western Harvester Co., then a subsidiary of the Caterpillar company, and has been in Peoria since 1938.

Research activities have been separated from the engineering department, and C. G. A. ROSEN is in charge of that department as director of research. J. R. MUNRO has been appointed general factory manager, and CHARLES A. WOODLEY has been appointed factory manager of the tractor division.

♦ ♦ ♦

RAYMOND MEADER, recently elected president of the New England Foundrymen's Association, is superintendent, Whitin Machine Works, Whitinsville, Mass. Mr. Meader was graduated from Worcester Polytechnic Institute in 1920 with a degree of bachelor of science in mechanical engineering. After serving his time in the foundry department of the Whitin Machine Works, he became associated with the Brown & Sharpe Mfg. Co., Providence, R. I., and was employed in the foundry of that organization for a short period. He then accepted a position with Rice, Barton & Fales in Worcester, Mass., and remained there until 1926 when he returned to the Whitin Machine Works as assistant foundry superintendent. He was made foundry superintendent of that organization in 1937.

Photo by C. A. Wyatt
Raymond Meader

♦ ♦ ♦

FRANK MAY, who is in charge of Navy material production at the Granite City plant of the American Steel Foundries, was honored for his 41 years of service with that organization during the recent flag and "E" pennant presentation ceremony at that plant. Mr. May started working in the coreroom of the American Car & Foundry Co. in St. Louis at the age of 11, and in 1901 joined the American Steel Foundries.

♦ ♦ ♦

E. STANLEY GLINES has been appointed chief of the aluminum and magnesium unit, Office of Price Administration.

♦ ♦ ♦

J. E. HEUSER, Ampco Metal, Inc., Milwaukee, has been transferred to the company's Cincinnati office to assist J. E. Cook of that division.

♦ ♦ ♦

F. F. SEAMAN, general manager, Robbins & Myers Inc., Springfield, O., has been re-elected chairman of the Electric Hoist Manufacturers' Association. A. S. WATSON, vice president, Detroit Hoist & Machine Co., has been made vice president.

♦ ♦ ♦

THOMAS S. MCEWAN, Chicago district manager, contract distribution division, War Production Board has resigned. His work will be handled temporarily by JOSEPH L. OVERLOOK, who recently was named Illinois state director of the division.

♦ ♦ ♦

HOMER L. SHAW has been appointed a research engineer, Battelle Memorial Institute, Columbus, O., and has been assigned to research in metallurgy. Mr. Shaw is a graduate of Muskingum College and was associated with the Jones & Laughlin Steel Corp., Aliquippa, Pa., prior to joining the Battelle staff.

♦ ♦ ♦

W. L. WHITE, director of laboratories, and H. SNYDER, manager of the roll covering and tank lining departments, Manhattan Rubber Mfg. Division, Raybestos-Manhattan Inc., Passaic, N. J., are now assistant factory managers. H. H. BURROWS has been appointed man-

(*Concluded on page* 84)

Harmon S. Eberhard

Charles A. Woodley

G. E. Burks

C. G. A. Rosen

J. R. Munro

Foundries turn out Better Castings faster at less cost with . .

TRULINE BINDER

Reg. U. S. Pat. Off.

Foundrymen have proved by years of experience in casting steel, grey iron, malleable, and non-ferrous metals, that:

1. Truline Binder cuts baking time up to 50%, thus effectively doubles core-oven output.

2. Truline permits the use of up to 75% reclaimed sand in many cores now made only with new sand and slower-baking binders.

3. Cores collapse fast because Truline Binder loses strength rapidly above 600° F. Thus danger of hot tears is reduced and cleaning is speeded 30% to 50% in many cases.

4. Smoother castings mean less cleaning, per casting, and fewer rejects by inspectors.

You, too, can make more sound castings quicker, and at less cost, with Truline Binder. Clip the coupon to your letterhead and mail it today. We'll see that you get full information, and a sample if you want it.

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Please send ☐ sample ☐ information on how to use Truline Binder in casting: .....
(state type of work and kind of metal cast)

NAME _____

COMPANY _____ TITLE _____

ADDRESS _____ CITY _____ STATE _____

JJ-47

(*Concluded from page* 82)

ager of the roll covering and tank lining departments and P. A. CADY will be laboratory manager.

♦ ♦ ♦

HOWARD D. GRANT, vice president, Whiting Corp., Harvey, Ill., has been named executive vice president and chairman of the executive committee. He will take over the duties of the president's office formerly handled by GEN. THOMAS S. HAMMOND, who resigned as president and a director to devote full time

Howard D. Grant

as a civilian member of the Chicago Ordnance District staff. As chairman of the executive committee, Mr. Grant succeeds C. Q. WRIGHT JR., vice president, who resigned to become naval adviser with the rank of lieutenant-commander for the state of Illinois, contract distribution branch, War Production Board, Chicago. STEVENS H. HAMMOND, vice president, has been elected a member of the executive committee. The son of General Hammond, he has been with the company more than 10 years, most of that time in the sales department, having been in charge of the field force in recent years. Many of General Hammond's former responsibilities will devolve upon him because of the close working relationship that has existed between them. He will also supervise all company sales activities.

♦ ♦ ♦

J. G. GREEN, formerly assistant sales manager, Louis Allis Co., Milwaukee, has been made assistant general manager of the Storage Battery division, Philco Corp., Philadelphia.

♦ ♦ ♦

PALMER E. HANSON has been appointed sales manager, Milwaukee Foundry Equipment Co., Milwaukee. Mr. Hanson formerly foundry manager, Mack Mfg. Co., New Brunswick, N. J., has been actively associated with the foundry industry for many years. Prior to his Mack Mfg. Co. connection he was affiliated with the former Waukesha Malleable Co., Waukesha, Wis., and Lakey Foundry & Machine Co. Inc., Muskegon, Mich., as foundry superintendent.

♦ ♦ ♦

J. P. HENRY has been appointed New England representative for Ampco Metal, Inc. Milwaukee. His office is located at 410 Asylum street, Hartford, Conn.

♦ ♦ ♦

FRED L. WOLF, technical director, Ohio Brass Co., Mansfield, O., has been given an indefinite leave of absence to take charge of graphite allocation and conservation, Metals Division, Branch K, War Production Board, Washington, D. C.

♦ ♦ ♦

G. B. BERLIEN, assistant superintendent for the past 2 years, and tool hardener for 13 prior to that, Lindberg Steel Treating Co., Chicago, has been named chief metallurgist, succeeding ROY G. ROSHONG, resigned, to engage in metallurgical consulting practice.

♦ ♦ ♦

EDWARD M. HICOK has been appointed to the new post of personnel relations manager for the manufacturing department, Western Electric Co., New York. Succeeding Mr. Hicok as comptroller of manufacture is JOHN M. STAHR, who has been works comptroller of the company's Hawthorne plant, Chicago, since 1936.

♦ ♦ ♦

HENRY A. SALLER has been named a research engineer on the staff of Battelle Memorial Institute, Columbus, O., and has been assigned to research in metallurgy. A graduate in metallurgy of Purdue University, Mr. Saller was associated with the Carnegie-Illinois Steel Corp. prior to joining Battelle.

♦ ♦ ♦

HAROLD M. MOORE, St. Louis representative of Manning, Maxwell & Moore, Inc., for several years a reserve army officer, has been called for active duty with a commission of captain.

JAMES H. WITHERS has been appointed representative for Manning, Maxwell & Moore, working out of the Los Angeles office.

♦ ♦ ♦

Baldwin Locomotive Works, Philadelphia, has announced the appointment of four division vice presidents as follows: HALDWELL S. COLBY, locomotive division; FRANK K. METZGER, Standard Steel Works division; FREDERICK G. SCHRANZ, Baldwin Southwark division; and NORRIS H. SCHWENK, Cramp Brass & Iron Foundries division. Their duties will remain substantially the same as in the past. AMOS G. COLE, works manager and LEWIS W. METZGER, production manager, have also been appointed to the locomotive division, reporting to Mr. Colby.

♦ ♦ ♦

E. K. SMITH, for the past 11 years service metallurgist, Electro Metallurgical Co., Detroit, has been given a leave of absence from that organization to become senior metallurgist, industrial service, Tank and Combat Vehicle Division, Army Ordnance Department, Washington. His wife, REBECCA HALL SMITH, has given up her metallurgical office in Detroit to take up similar work at

Stevens H. Hammond

the Naval Gun Factory, Washington Navy Yard, Washington.

♦ ♦ ♦

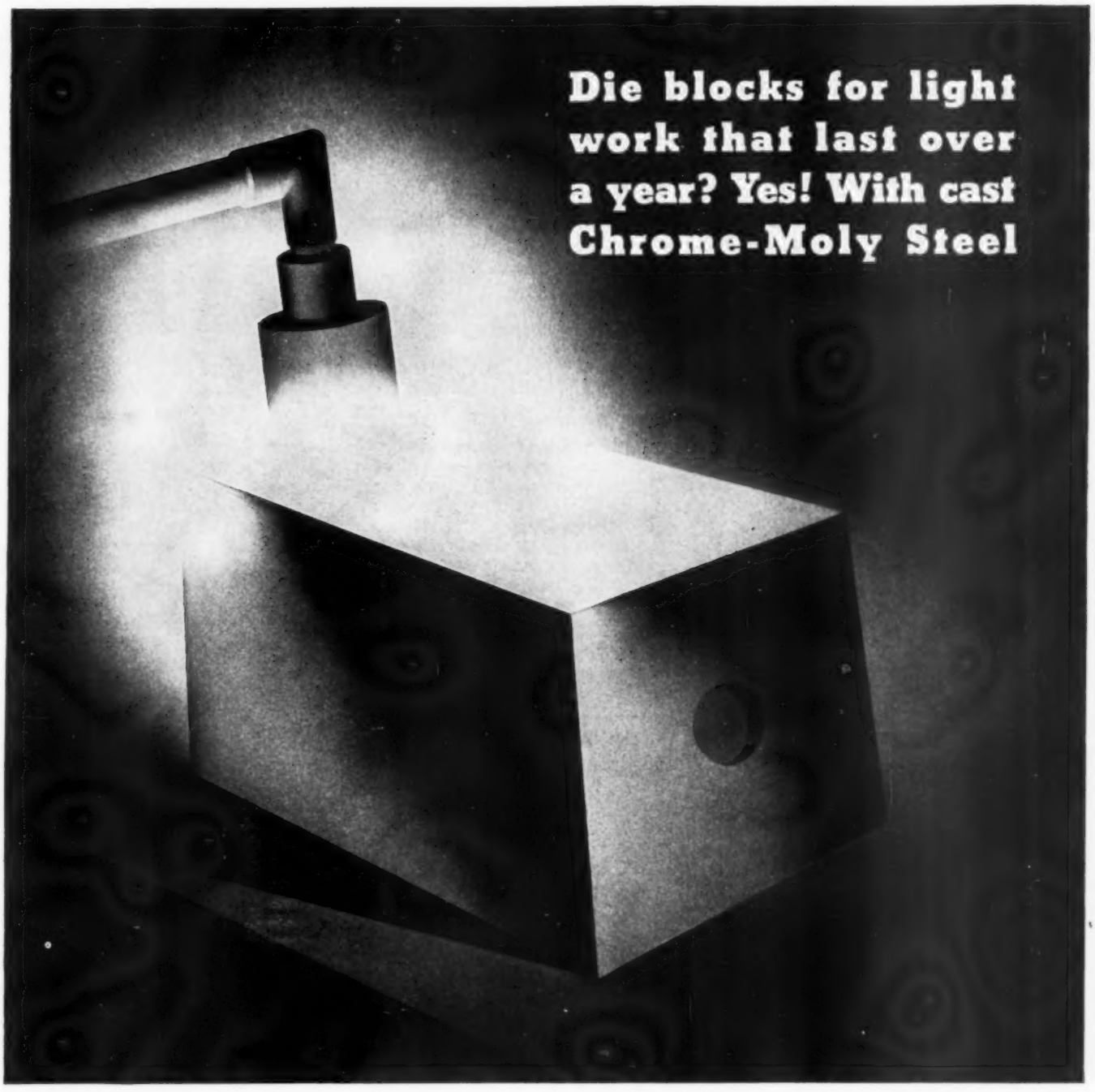
J. M. TUCKER has been appointed priorities specialist on farm equipment on the staff of Samuel S. Stratton, technical consultant to the director of priorities. Mr. Tucker has been associated with the farm equipment industry for many years as vice president and general sales manager of the Oliver Farm Equipment Co., Chicago.

♦ ♦ ♦

DR. C. F. RASSWEILER has been appointed a vice president of Johns-Manville Corp., New York. In his new office, Dr. Rassweiler, who joined the company in June, 1941, as director of research, will continue in charge of the company's research and development activities not devoted largely to converting the full production capacity of Johns-Manville to war uses.

♦ ♦ ♦

At a meeting of the board of directors, Sanitary Co. of America, Linfield, Pa., the following officers and directors were elected: President and treasurer, HARVEY D. RITTER; vice president, WILLIAM L. JONES; secretary, HENRY P. CARR; assistant secretary, H. MAY FISHER; assistant treasurer, R. E. GESCHWIND. Directors, HENRY P. CARR, THOMAS C. EGAN, WILLIAM L. JONES, R. M. MARSHALL, and HARVEY D. RITTER.



Die blocks for light forging hammers are being economically made of cast Chromium-Molybdenum steel with notable results.

The particular analysis used in one case is about 0.40% C, 0.60% Cr and 0.25% Mo. Normalizing is from 1700° F. and tempering at 700° F. to produce a hardness of 260 BHN. The working surface is then flame hardened to about 650 BHN and tempered at 700° F. to produce a final case hardness of about 400 BHN.

The net result is a block with a case amply hard to meet the service conditions, combined with a strong, tough core. Some of these blocks have lasted over a year in service without showing signs of wear.

Write for our free technical book, "Molybdenum in Steel". Section 13 gives authoritative data on Molybdenum cast steels.

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MOLY

THE ADVENTURES OF BILL

BY PAT DWYER — **Drawings By RICHEY**

AT THE conclusion of a rather amusing program on the radio one night recently, Bill admitted it was fair to middling for a warmed over mess of old baloney. He said he had heard a better little annygoat, or whatever-you-call-'em, in the shop one day during the past week.

"Annygoat?" I said in well feigned and polite astonishment. "Do you by any chance mean a nanny goat, the female of the species better known through the male representative with the chin whiskers and the long, curved horns, the billy goat? And just what do you mean, you heard one? So far as my admittedly meager knowledge of the beast is concerned, there is nothing peculiarly musical, harmonious or attractive about the plaintive wail of a goat, male or female. Now if you had smelled one—"

"Quiet! I am not talking about your goat friends, the smelly kind that live on tin cans, bill board lithographs, garments hung on the clothes line, thistles, burdocks and stinking willies that grow by the wayside. You can have 'em all. My annygoat is a short story that does not need either fumigation or a dash of disinfectant."

"I get it. You mean an anecdote."

"A nanny dote, says he. What's the idea of springing the baby talk? Enough of that stuff is enough and a little too much. I suppose your next move will be to sit there with your finger in your mouth and say to me, 'Oh, doodie! Dranpa is doing to tell a ittie bittie tory about a nice ittie pet dote he had one time.' Well, I'm not. And don't call me Dranpa. Do you want to hear this elegant bit of a story, or don't you want to hear this elegant bit of a story?"

"No," I said. "It probably has a beginning, but judging by past experience it will have neither a middle nor an end. Furthermore and in addition thereto, I'll be glad to put the same identical statement in writing any time you say the word."

"Spoken like a true man and a patriot. Your bold declaration of principle will go ringing down the corridors of time with *Remember Pearl Harbor, Remember the Alamo* and *Remember Your Best Friend Is Your Mother.* Correction, please. Strike out that last item. With your everlasting crabbing and nagging, you must have been a heavy cross in the old homestead, a cross between a weasel and two pigs under a gate."

He must have his vitamins

"Now you bring a gate into the story. I thought you were talking about a goat."

"Sweet mother in heaven." Bill threw hands and eyes upward in pious supplication. "Grant me patience. If no patience is available, or available only on a priority list, grant me a good, heavy, substantial shillaly. This here now little annygoat I have in mind concerns a young gent by the name of Johnny Hunnigunkle."

"How old is this young gent and if I am not too bold or inquisitive, is Hunnigunkle his real name or one you invented, I was going to say on the spur of the moment, but manifestly that is impossible. A double jointed, compound articulated name like that involves some earnest thought and probably deep research."

"The boy's age was ten summers and presumably the same number of winters, springs and falls. His name is Hunnigunkle whether you like it or not, and what is more to the point at issue, do you want to make something out of it? What possible difference does his age, name, nationality or former state of existence make in the presentation of a story?"

"None." I hastened to assure him. "None at all. Do you happen to know if he had a father and mother. Was he an only son, or did he have one or more older or younger brothers and sisters?"

"How do I know? And outside of yourself, who cares? This is not a three volume English novel which drags in every relation of the family from the time of Alfred the Great to the period of the Crimean war, with the promise of a fourth volume dealing with the branch of the family which emigrated to America and formed an oasis of culture in these headstrong and revolutionary colonies. Does that answer your question satisfactorily and are you still aching to hear the story of Johnny McGory — pardon me— Johnny Hunnigunkle?"

"The answer to both questions is NO."

"That's the way I like to hear a man talk. Now that I have aroused your intense interest and overwhelming curiosity I can go ahead with a clear conscience and tell you the story. Listen.

"The sunday school teacher had selected the chapter in the catechism which carries the question Where is God? and the well known answer God is everywhere. She explained the statement, as she thought, quite satisfactorily and

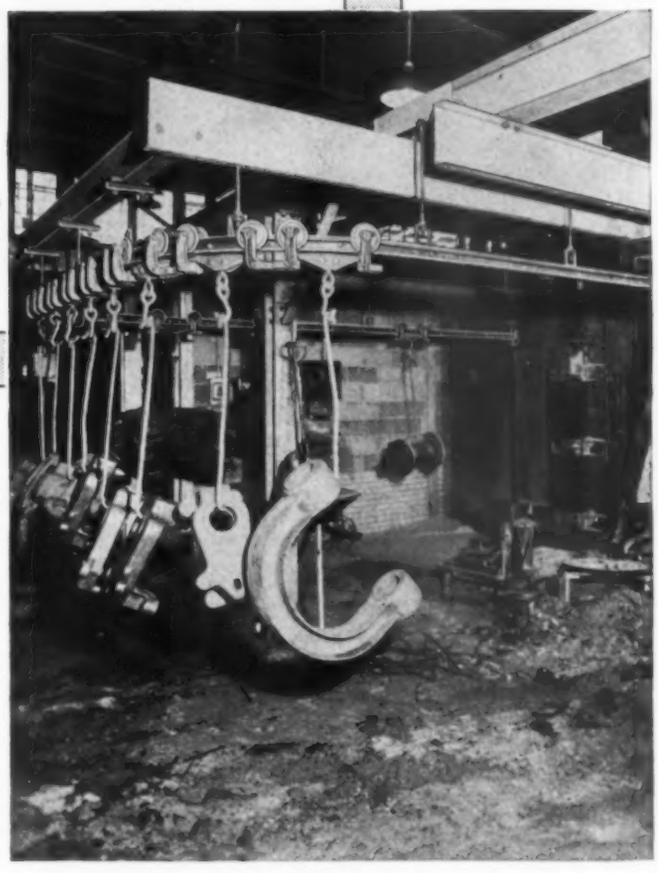
(*Continued on page* 88)

Now PRODUCTION Doubled-Trebled

NEVER before in the history of this great country of ours has the demand on industry been so great. It is production—faster, faster, faster! And faster production means systematic production. All work must move along easily, quickly, and efficiently.

American MonoRail Equipment increases and helps speed up production. It also reduces handling costs. It relieves men from lifting and carrying, and enables them to give full time to production. American MonoRail Equipment keeps materials and products on scheduled routes without congestion, delay, and damage in transit.

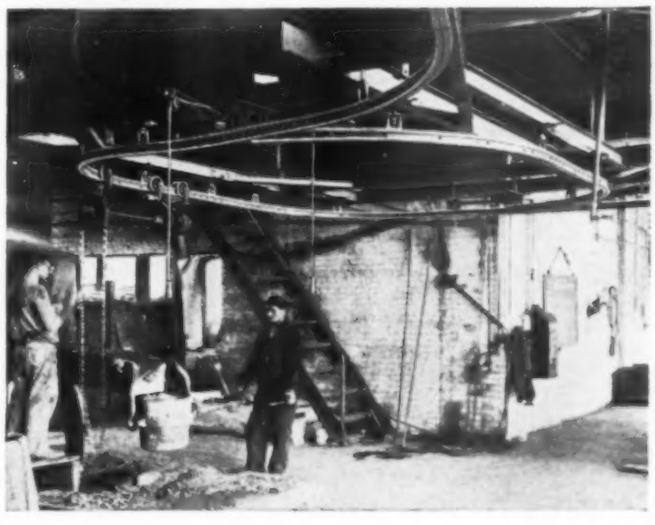
Standard parts are assembled into complete systems to meet the special requirements of the particular job. Supplied for manual, electric, or automatic operation. No job too small, none too large. No interruption to your production during installation. Let an American MonoRail Engineer show you how to "open the production throttle" in your plant.



Easy rolling trolleys speed up movement of heavy castings through sand blast room.

●

Flexible MonoRail arrangement insures safe handling at cupola.



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WRITE FOR Blue Book illustrating hundreds of MonoRail installations.

IF YOU *Plan* TO BUILD OR EXPAND ★ ★ ★

The complete facilities of our engineering staff are at the disposal of any company—their architects or engineers—planning to expand or construct new buildings. Through long experience, we are able to cooperate effectively in planning right heights, proper sizes and placement of structural members, and in other ways which result in buildings being designed to fit the needs of the user. This service is yours for the asking.

(*Continued from page* 86)

within the comprehension of even the most dull witted member of the class. Just goes to show how neatly Robbie Burns touched the bull's eye on the target when he said, 'The best laid plans o' mice an' men gang aft agley.' "

"I thought John Stinkbeck was the lad who wrote about mice and men. I do not think the broadest minded member on the board of trustees would tolerate that product of the barn yard in a list of Sunday school books."

"Rob was quite a lad in his day, but I am afraid he took a whirl or two around in his grave when and if he learned how the phrase of his own coining had been prostituted in this land of the free and the home of the brave. There are mice and mice, if you know what I mean dearie. Also there are men and men and I am quite sure I am safe in making the statement that Rob and John did not sup their porridge from the same bowl. However, all that has nothing to do with this truthful little annygoat of J. H. the Sunday school scholar."

"I am glad you cut the name down to the initials. That long and outlandish name if you will pardon the slight vulgarism—was kinda getting in my hair."

"Your hair, hey? If you don't get something in your hair pretty soon, you won't have something to put anything in. May be a trifle involved, but when you think it over I am inclined to the opinion you will get the general drift."

"Push on man. Push on. At the rate you are going your bright little scholar will be minus hair and teeth before you get him out of the Sunday school."

"Not this lad. He will get out under his own power as soon as he is ready. His quick thinking and ready wit are the features which make the story worth retailing."

"I wish you would tell me where I can find this remarkable young creature. I believe I could save valuable time by hunting him up and getting the story at first hand."

"Tut, tut, my good man," Bill waved a mildly admonitory finger. "That is not the proper old school, shoulder to shoulder, one for all and all for one spirit for the party of the second part to show when the party of the first part is shooting the—what I mean to say when the party of the first part is telling a gentle and moving Sunday school tale."

"I move an amendment to the effect that the place where you nearly tripped be allowed to stand. Do I hear a seconder?"

"No," said Bill. "You don't hear a seconder. The original motion is carried unanimously that the present speaker continue with the highly instructive, informative and interesting description of how a smart young fellow arrived at a conclusion and offered the solution to a problem that has engaged the earnest attention of many minds since men shed their tails, came down out of the trees and began speculating on where they came from and where do they go from here."

"Better reeve a little more cable. The wind is rising."

"Shut off the bazoo and stand by to let go the halliards. We'll drop the anchor in a few minutes.

"The Sunday following the events detailed in the preceding chapter, the teacher conducted a mild quiz to discover how much of the precious information had been absorbed and retained by the dear little boys and girls. With the peculiar and uncanny instinct—I think it must be a gift—which enables a teacher to settle on a pupil whose mind is on anything except the lesson, this teacher asked the question, 'Where is God?' She raised her hand for silence. Smiling benignly she pointed to our hero and announced sweetly. 'You may answer, Johnny.'

"She nearly collapsed when brave Johnny confidently piped up, "In our bathroom.'

" 'Why Johnny,' she gasped in astonishment, 'where did you get that idea?'

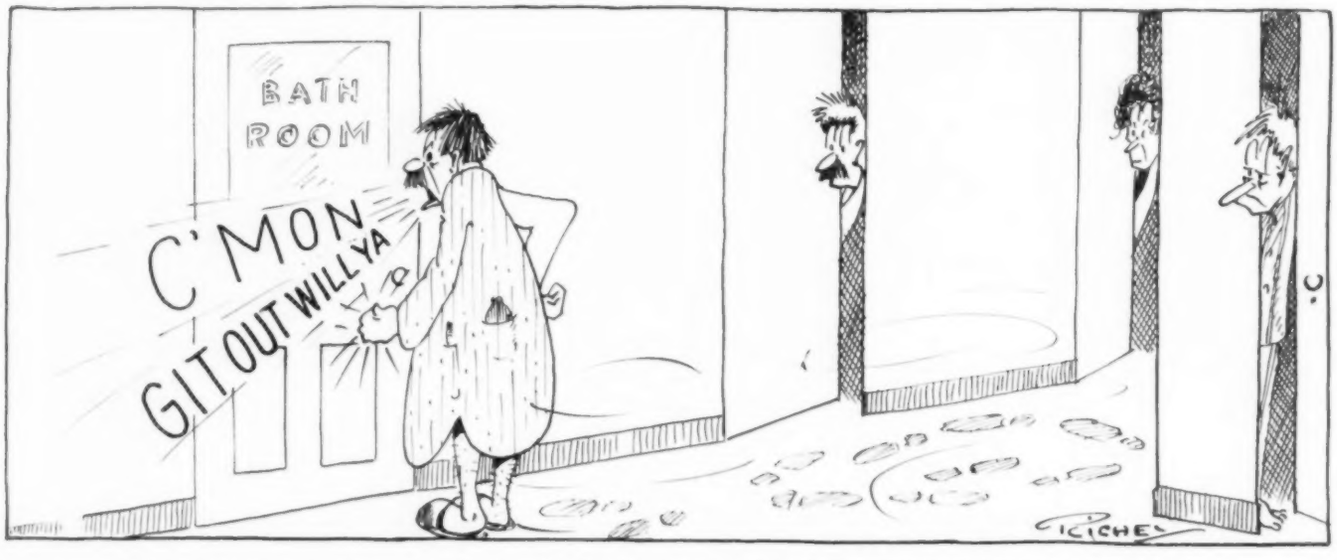
" 'If you please teacher, this morning I heard the old man—excuse me teacher I mean my papa—I heard my papa knocking three or four times on the bath room door. Then he got right peevish and yells 'My God, are you going to stay in there all day!'

"Purry good, eh? I thought you would like it. When you are through applauding I have another item worthy of your attention.

"I had a letter recently from a man who wrote that he had a prospective improvement on a 12-ounce beverage bottle and would appreciate any information on how molds are made for glass bottles. He claimed that a search in the local public library failed to show anything on the subject.

"I wrote him that it was unfortunate his library had no back copies of THE FOUNDRY. Articles have been presented on several occasions dealing with various phases of castings for the glass industry. Basing an opinion merely on the brief inquiry I could see no pressing reason for familiarizing himself with the making of the molds. All he has to do is to make a drawing or prepare a description, oral or written, and present it to a pattern-maker, foundryman or machinist. He will take care of the design and the mechanical features involved in the production of the iron mold. I

(*Concluded on page* 158)



From a famous sporting print "Lining Up At The Barrier For The Great American Morning Derby"

EVERDUR INGOTS

This copper-silicon alloy possesses many of the desirable properties of the tin bronzes.

The nominal composition of Everdur Ingots is Copper, 94.90; Silicon, 4.00; Manganese, 1.10. This composition will meet the requirements of recognized standards such as Navy Specification 46B28 and Federal Specification QQ-C-593.

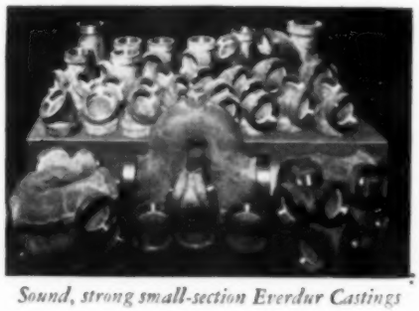
Everdur standard test coupons cast in green sand will have these approximate physical properties:

Tensile Strength	50,000 p.s.i.
Yield Strength*	20,000 p.s.i.
Elongation	25% in 2″
Reduction in Area	*25%
Brinell No.	80
(10 mm. ball, 500 Kg. load)	

*At 0.50% elongation under load

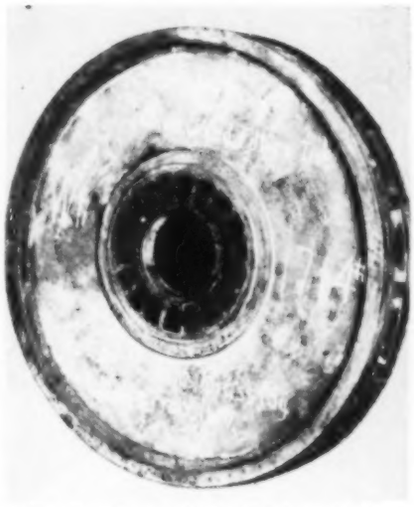
General Properties

Melting Point	1832°F. (1000°C.)
Specific Gravity	8.23
Weight	0.297 lb. per cu. in.
Pattern Maker's Shrinkage	3/16″ per ft.



Sound, strong small-section Everdur Castings

Everdur has been successfully used over a 15-year period for the production of strong, sound castings. It is furnished ready for use in 25-pound notched ingots and can be melted and cast by regular brass and bronze foundry equipment.



Cast Everdur manifold. Weight 1,714 lbs.

Foundry Practice

Anaconda Publication E-1, offered free, presents a *detailed* discussion of foundry practice with Everdur.

Contents of this publication include suggestions for composition and control of the charge; types of furnaces for melting; fluxing and melting procedure; practices in molding, types of sand, core construction, pattern making, gating, etc. Pouring data are presented, as well as detailed instructions for the cleaning and finishing, machining, welding and heat treating of Everdur castings.

Summary

Everdur copper-silicon alloy for casting purposes is a high-strength material, relatively inexpensive but possessing many of the desirable properties usually associated with higher-priced metals.

Everdur offers outstanding resistance to a large number of normally corrosive solutions and atmospheres. Obviously, it is not equally resistant to all. Information regarding the corrosion resistance of Everdur under specific conditions may be obtained from the Technical Department of The American Brass Company. This service is available without cost.

Anaconda Publication E-1, 6th Edition, contains detailed information on general properties, charging, melting, molding, pouring, etc., of Everdur Metal. Write for a copy. 41158A

Everdur Metal

THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.—*Subsidiary of Anaconda Copper Mining Co.*

EVERDUR is a trademark of The American Brass Company, registered in the United States Patent Office

By A. H. ALLEN
Detroit Editor, The Foundry

AMONG DETROIT FOUNDRIES

AS INTIMATED in this dispatch for last month, the gray iron foundry of Buick Motor Division in Flint has felt the impact of full-scale war production by the motor industry and has shut down its cupolas, probably for the duration. Meanwhile, however, its 1700 workmen took heart from recent unofficial reports that they would be able to find work this summer in what promises to be the world's largest aluminum foundry, to be erected by Buick at a cost of $10,000,000, and eventually employing 6000.

The foundry will supply light metal castings needs for General Motors radial aircraft engine production, both Buick and Chevrolet now organizing to turn out Pratt & Whitney engines in mass quantities. Buick already has started assemblies in a large new plant at Melrose Park, Ill., while Chevrolet is tooling several plants for assembling a somewhat smaller engine than that produced by Buick.

The Flint foundry will be the second new aluminum foundry for General Motors, the first being the Delco-Remy plant at Anderson, Ind., now busy supplying aluminum casting requirements of the Allison Division at Indianapolis. The latter plant was built in record time in the face of urgent demand for castings to satisfy the greatly expanded Allison production program, and it is expected that the Flint foundry will even surpass the construction record at Anderson, present plans calling for first production some time this summer.

Detailed information on the new foundry has been withheld so far by the War Department. However, it is expected that full particulars will be released shortly, since ground already has been broken for the plant. There will be ample outlet for aluminum castings from Flint, for General Motors has also set up a new eastern airplane manufacturing division, which will undertake production of fighter planes for the Navy. Further extension of GM activity in aircraft is expected in the bomber picture. At any rate these two new ventures will require their share of aluminum castings.

Outlook for the Dodge gray iron foundry continues good, with all men likely to remain at work when production gets under way on a new tactical vehicle for the Army and the switch is made to Chrysler automotive engines for M-4 tanks this summer. At this writing, nothing definite has been lined up for the Packard foundry, but there is reported to be "an iron in the fire which is getting pretty hot."

Prospects of using a good many diesel engines in M-4 tanks to be built by Fisher Body at Flint suggest the Cadillac foundry may be kept busy supplying necessary castings for these engines which will be built by General Motors Diesel Division here. Cadillac already is supplying a number of castings for this division.

Increasing assemblies of Army trucks will mean at least partial operations by the Pontiac foundry, although even the largest conceivable truck orders would not occupy the full capacity of the plant.

It is reported that new restrictions have been placed on steel for armament castings by the government. Substance of the regulations is that steel processed in cupolas and bessemer converters is not acceptable. Only material produced in open hearths or electric furnaces is suitable. This regulation has scotched some plans for converter installations in foundries which were planning to change over from gray iron to steel for armament. One cancellation is the Saginaw Malleable Iron Division. This project has been suspended, and the steel will be processed fully in electric furnaces.

The question is being asked: What about foundries processing steel by the triplex process of cupolas, bessemers and electric furnaces? It can be argued reasonably that steel made by this process is actually electric furnace steel, since the final treatment and refining is done in electrics, and the cupolas and bessemers really serve only to produce a "synthetic" scrap which conceivably could be of a much superior grade to the kind of real scrap that can be collected these days.

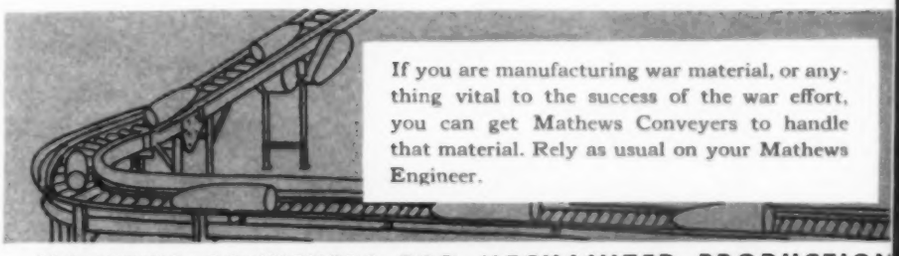
Expansion in production of cast steel shells continues at a rapid

(*Concluded on page* 93)

A 65-ton gray iron turbine base recently made in the Trafford, Pa., foundry of Westinghouse Electric & Mfg. Co., which will be part of an 80,000 kilowatt steam driven turbo generator. The base is 29 feet long, 12 feet high and 9 feet wide

Blockades aren't Limited to the *Seven Seas*

● The most serious blockades in America's war effort today are those occurring in the great plants producing war materials. Delay in getting parts and assemblies from one machine to the next, and the lack of a definite production pace tieing together all departments, is keeping production down. Mathews engineering hours are devoted entirely to the solution of these problems. Mathews Conveyers are breaking these blockades by speeding materials from one machine to the next, through inspection and into cars or ships. The success of our production depends upon our keeping materials moving. Mathews Conveyers are moving them.



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

Mathews CONVEYER CO.

ELLWOOD CITY, PA.

PRODUCTION more than DOUBLED with MAEHLER OVENS

Paper Prepared for

MEEHANITE INSTITUTE MEETING

gives full account of outstanding economies at ATLAS FOUNDRY, DETROIT

PRODUCTION:

1. Increased from 182 tons per week, including Sundays, to 396 tons per week regular time. Four times number of molds as formerly.

2. Now bake large molds thoroughly which formerly could only be torch dried.

3. Maehler airheat bakes large and thin sections of same mold and core without burning the light sections.

4. Can load molds with only 4 inch space between them.

HEAT LOSSES IN RELOADING

In transferring individual racks when pushing the core output, only 50 degrees oven heat loss is experienced, and temperature returns to normal in 4 minutes.

BAKING CAPACITY EXAMPLE

2 cores 29 x 72 x 30—4016 lbs.
4 cores 33 x 72 x 30—4548 lbs. 9 hrs.
(Total sand weight 26,224 lbs.)

PERFECT EXAMPLE 5 HR. BAKE (CORES)

1—50"x10'2"x72" Weight sand—22,700 lbs.
2—56"x7'5"x8½" Weight steel—16,600 lbs.
1—78"x11'0"x12" Temperature—450°F
2—54"x7'6"x12" Arrived at temperature in 90 min.

ECONOMY

Above 5 hr. load, gas cost $ .84 per hour. Cost of fuel for baking equals $ .375 per ton.

PERFECTION

Baked core color so closely approximates green core that operators mark racks to avoid error in loading.

DESCRIPTION OF MAEHLER OVENS

2 compartments each 12'0" wide x 9'0" high x 18'0" deep. Car and rack combination, electric lift doors both ends of 1 section, one end second section.

Two #4-35-11000 CFM airheaters driven by 7½ HP motors. Leeds and Northrup Mixcromax controllers. Wheelco Flametrol safety equipment.

Automatic time and temperature control of heat rise and shut-off.

It's results like these that are bringing orders and re-orders for Maehler Core Ovens. Join the parade for lower costs, greater production and better cores.

Ask Maehler engineers to figure the ovens for your plant.
Write today and ask for NEW CORE OVEN BULLETIN!

THE PAUL MAEHLER COMPANY
2200 W. Lake St., Chicago, Ill.

MAEHLER Core Ovens

(*Concluded from page* 90)
pace. One upstate plant is planning to produce 350 tons of shell daily, already is casting large shells four in a mold, point end up. Another project will use an adaptation of the centrifuge for shell casting, with molds attached to the ends of radial arms. After pouring metal in the molds the arms will start to rotate and centrifugal force will drive the molds to a horizontal position and force the steel solidly into the outer end of the mold, making for a dense and homogeneous casting.s

STEEL FOUNDERS STUDY

Problems Brought By War

ANNUAL meeting of the Steel Founders' Society of America, held at the Edgewater Beach hotel, Chicago, Feb. 11 and 12, attracted the largest attendance in the history of the society. Over 200 executives of the industry attended the 2-day meeting and participated in the discussion of problems which the war has brought to the producers of steel castings. The Wednesday meeting was dedicated to the Army, while the work of the Navy featured the Thursday gathering.

Officers Presented Reports

The opening session was devoted to remarks by the new president of the society, Oliver E. Mount, American Steel Foundries, Chicago, and to the reports of Merrill G. Baker, executive vice president and Raymond L. Collier, secretary-treasurer of the organization. Reports of the following committees also were made: Advertising, occupational classifications, raw materials, specifications, statistic reports, and technical and operating.

The luncheon on Wednesday noon featured the address of President Mount, a short talk by General Cummins of the Sixth Corps area, and an address by Josh Lee, United States senator from Oklahoma. Senator Lee pleaded for confidence and understanding in this time of emergency between government and the people of the country.

L. C. Wilson, Reading Steel Casting Division, American Chain & Cable Co. and chairman of the technical and operating committee of the Steel Founders' Society, presided at the technical session on Wednesday afternoon. Edwin C. Barringer, executive secretary, Institute of Scrap Iron and Steel, Washington, discussed, "The Steel Foundry Scrap Problem," and indicated the difficulties which members of his organization have encountered in endeavoring to supply a steady flow of scrap. Mr. Barringer suggested that complete allocation of scrap would be the most satisfactory solution to all concerned, but pointed to the difficulties encountered in such an operation. The speaker discussed the necessity of determining if a plant is confronted with an emergency as far as scrap is concerned, and indicated that a three weeks' supply surely would not come within that category. If an emergency exists, the matter should be directed to the attention of Alex Miller of the Scrap Division, Raw Materials Section, Iron and Steel Branch, War Production Board, Washington. Mr. Barringer stated that industry also should back up efforts to secure more scrap from farms and the automobile graveyards. He stated that a large amount of scrap is available in this country and the proper steps must be taken to get it into the hands of the foundries and steel mills.

Discusses Molybdenum

E. R. Young, Climax Molybdenum Co., Chicago, presented an instructive technical discussion, "Molybdenum in the Defense Program." Mr. Young indicated the amount of molybdenum available for war work and discussed the essential and optional uses of molybdenum in steel castings. He also gave specific instances where that alloy should not be used to obtain certain properties and indicated that every effort should be made not to employ alloys where the use of such materials cannot be justified metallurgically or practically. He presented a number of slides showing how molybdenum in small amounts, usually in conjunction with other alloys, may be used to obtain certain metallurgical and physical properties.

"Use of Aluminum in Steel Castings" was discussed by Walter Bonsack, National Smelting Co., Cleveland. Mr. Bonsack pointed out that in many war operations where aluminum scrap is produced, this scrap is contaminated with steel to such an extent that the secondary products cannot be returned as raw products to the same war industries. However, this type of material provides an excellent source for metallurgical aluminum. The speaker discussed the four grades of metallurgical aluminum as provided in the 1941 specifications of A.S.T.M.

In the final paper which was prepared by Howard F. Taylor and Edward A. Rominski, Naval Research Laboratories, Washington, on the subject, "Atmospheric Pressure and the Steel Casting—A New Technique in Gating and Risering," Mr. Taylor discussed in detail the blind risering method and showed a large number of slides illustrating work which has been done in that direction.

An inspirational talk, "The Role of the Steel Foundry Industry in the War," by S. Wells Utley, president, Detroit Steel Casting Co., Detroit, opened the Thursday morning session. Mr. Utley pointed out that during normal times the greatest job of the producers of steel castings is to convince the engineering world of the superiority of steel castings. In his opinion more progress related to the technical developments of steel castings has been made during the past 10 years than in any previous decade in the history of the industry. Although steel castings have been thoroughly dependable during all of these years this progress has made them even more so today.

Selling Steel Castings

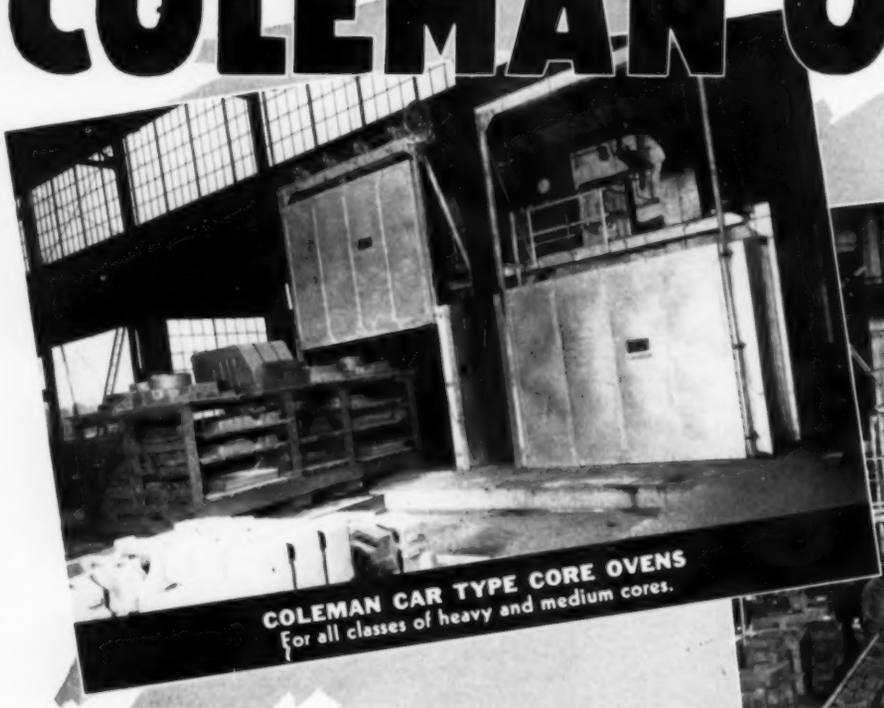
The battle of mechanized warfare has succeeded in selling engineers on the fact that steel castings are a superior product to meet war needs. Ordinarily a number of years would have been required to accomplish the selling job that has resulted quickly from the tremendous demand for production of war machines. Mr. Utley suggested that the industry should not accept orders for steel castings where it is known that particular provisions of the specifications cannot be met in a technical and practical way. Effort should be made to have such specifications changed before the work is undertaken.

Chauncey Belknap, legal counsel of the Steel Founders' Society of America, in a paper, "Latest Developments of Interest to the Industry" discussed the price control act and the recent amendment No. 1 to price schedule No. 41 for steel castings. Henry M. Busch, professor of sociology, Western Reserve University, Cleveland, was the final speaker on the morning program. In discussing "America's Stake in the War" Professor Busch considered many of the factors which have complicated the situation today and indicated where our dangers lie.

The luncheon meeting featured a talk by Gus W. Dyer, professor of economics, Vanderbilt University, Nashville, Tenn., on "American Business Will Not Retreat." Several naval officers were at the

(*Concluded on page* 96)

COLEMAN OVENS



COLEMAN CAR TYPE CORE OVENS
For all classes of heavy and medium cores.

COLEMAN TOWER OVENS
Amazing production with these high-speed continuous ovens.

COLEMAN CAR TYPE MOLD OVENS
Built in all sizes to handle all "dry sand" requirements.

Over 6,000
INSTALLATIONS
for America's
Leading Foundries
Prove
Coleman Oven
Leadership

Coleman CORE a

Mean Action!

FASTER CORE BAKING, MOLD DRYING--

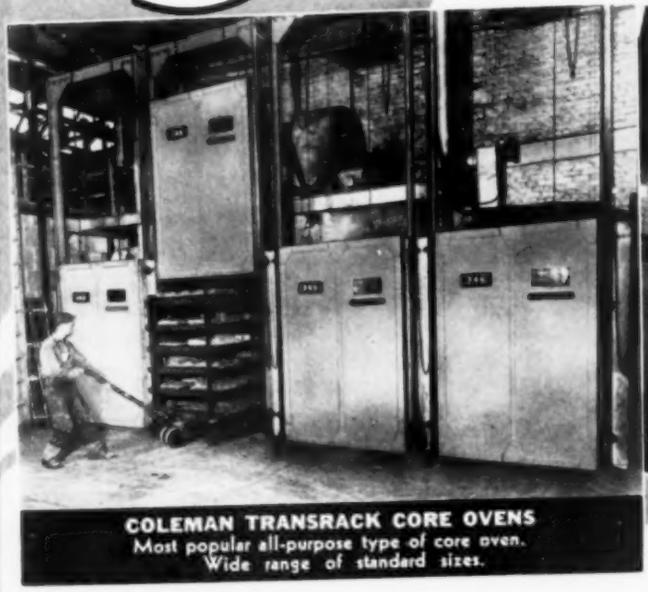
50 to 75% GREATER SPEED

Over 36 Years' Experience

CORE AND MOLD OVENS
All Types, Sizes Fuels

Since production of mechanical war equipment begins in the foundry, early victory demands immediate production of more and better castings! Coleman Ovens will help do this job through the dependable production of perfectly baked cores and properly dried molds. . . . For more than 36 years Coleman Oven Engineers have specialized on foundry ovens—to bake cores swiftly, perfectly, economically—and to put an end to casting rejects due to improperly baked cores. . . . Write for Coleman Oven Catalog, or write for a Coleman Oven Engineer.

THE FOUNDRY EQUIPMENT CO.
BUILDERS OF COLEMAN AND SWARTWOUT OVENS
CONTRACTING ENGINEERS AND MANUFACTURERS
CLEVELAND, OHIO



COLEMAN TRANSRACK CORE OVENS
Most popular all-purpose type of core oven. Wide range of standard sizes.

COLEMAN ROLLING DRAWER CORE OVENS
Wide range of sizes for high speed baking of medium and small cores.

and MOLD OVENS

(*Concluded from page* 93)

speakers table and Admiral Cluverius, Navy Public Relations Department, Washington, spoke briefly. As part of the luncheon program the Lorenz memorial medal of the society was presented to Donald C. Bakewell, vice president, Union Steel Castings Division, Blaw Knox Co., Pittsburgh, and an immediate past president of the society, for his unselfish services to the steel castings industry.

The afternoon session was devoted entirely to a panel discussion on "Excess Profits, Corporate Income and Capital Stock Taxes."

Pitch Extinguishes Magnesium Fires

More effective methods of extinguishing magnesium fires in commercial plants have been developed by the Bureau of Mines, according to Dr. R. R. Sayers, director of the bureau.

When hard coal-tar pitch in granulated or flaked forms is spread upon a magnesium incendiary bomb or a small magnesium fire, the coal-tar pitch softens and forms an airtight blanket which quickly smothers the flame. This method is regarded as superior to the use of sand and water or prepared compounds.

Sand helps prevent the spread of the fire, but it does not actually seal out the air and stop the flame. A spray of water or prepared compound ordinarily hastens the speed of burning and protects the surrounding area, but if applied directly in jets may cause violent explosions and emission of hazardous gases.

The hard coal-tar recommended by the bureau is sometimes called "fuel pitch" and it can be made available through a number of commercial firms at reasonable cost. The granulated or flaked form is necessary because a powdered pitch has explosive characteristics similar to those in coal and other dusts. This so-called hard pitch will soften at about 300 degrees Fahr., and is easy to handle and transport.

Incendiary bombs are magnesium alloy cylinders filled with thermit, a mixture of aluminum and iron oxide, which supplies its own air and burns fiercely at a temperature of 4880 degrees Fahr. when ignited by a fuse in the nose of the bomb. Nothing can extinguish this thermit, which will burn itself out, however, in less than a minute. The magnesium tube will continue to burn for 15 minutes unless something is done to keep it from getting the air necessary for combustion. That is where the pitch does its work.

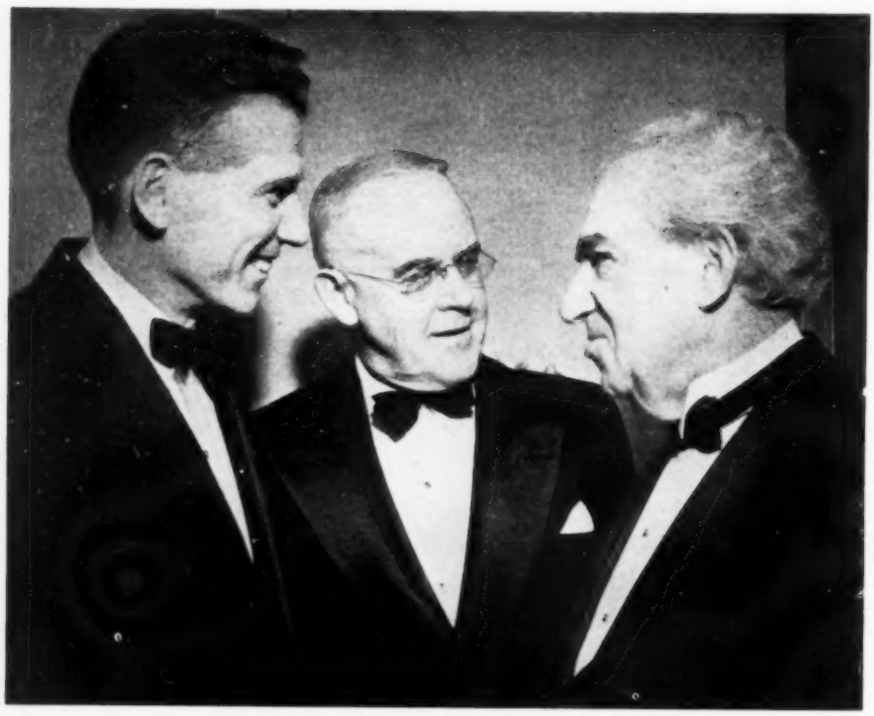
In dealing with an incendiary bomb on concrete or metal, use a shovel or scoop to spread—NOT throw—a layer of pitch over it. If a short flame persists, apply another layer of pitch and allow it to cool 10 minutes before removing it in a bucket or metal container. Although the bomb may continue to smoke for a few minutes, it will not burn again because the pitch encircles it in an airtight blanket, shutting off its necessary oxygen supply.

To extinguish a bomb on a wood floor cover the bomb with a layer of pitch to stop the heat and glare. Then spread a layer of pitch on the floor nearby, rolling the bomb with a long-handled shovel or hoe on this layer and covering the entire mass with more pitch. This is necessary because the burning bomb can get air through the pores and cracks of the wooden floor.

May Use Water

Fires already started in wood or other nearby combustible material by the bomb may be put out with water or prepared chemicals, taking care not to direct such a stream on the bomb itself. A bomb rolled in pitch this way is completely extinguished and does not have to be removed from the building immediately. After the pitch has cooled sufficiently to handle, it can be removed simply by rolling it up like a carpet.

In addition to its effectiveness in extinguishing small magnesium fires, the pitch method is distinctly advantageous in industrial plants because it is not abrasive and, unlike sand, is not likely to damage costly machinery. Plant fires are controlled with methods similar to those recommended for incendiary bombs with the exception of large fires in storage sheds. In this case the best thing to do is remove as much as possible of the unburned magnesium, erect a barrier of sand or other noncombustible material around the fire, and spray adjacent buildings with water.



The foundry industry was well represented at a recent meeting of the Employers' Association of Milwaukee. Reading from left to right, William Grede, president of Grede Foundries Inc. and president of the association; S. Wells Utley, president of the Detroit Steel Casting Co.; and Channing Pollock, author. Both Mr. Utley and Mr. Pollock addressed the meeting

Book Review

Minerals Yearbook - Review of 1940, cloth, 1459 pages 5¾ x 9 inches, published by the United States Government Printing Office, Washington, D. C., and available for $2.

Each year the Bureau of Mines prepares this interesting review of the production and consumption of minerals, and this volume for 1940 follows the high standards set by previous issues. It was prepared under the direction of E. W. Pehrson, chief of the economics and statistics branch of the bureau and edited by H. D. Keiser. The book is divided into 4 main sections of which the first is a general summary, Part II is devoted to data on metals including the common metals and alloys as well as the precious and semi-precious. Part III relates to the various nonminerals while Part IV discusses mine safety. A 20-page index in addition to sectional headings aids in locating references quickly.

H. B. KLAR

Record: Experienced foundryman, joined organization 17 years ago, in March, 1925. Now Sales Engineer.

Territory: Northern New York, Western Pennsylvania, Maryland and District of Columbia.

Address: 39 Grimsby Road, Kenmore, N. Y. Phone, Riverside 7017.

IN THE THICK OF *America's* PRODUCTION BATTLE

America's biggest battle must be fought and won on the production lines of industry. H. B. Klar, like every member of Osborn, is giving freely of his time and experience to insure a final, decisive victory.

His is a contribution of major importance. As an Osborn representative, he has observed and studied moulding problems over a period of 17 years. This knowledge and that of his entire organization is always available to his customers—and the confidence which both Mr. Klar and Osborn equipment enjoy among foundrymen in this territory is evidence of the value they place upon this service.

THE OSBORN MANUFACTURING COMPANY

5401 Hamilton Avenue *Cleveland, Ohio*

OSBORN

MOULDING MACHINES

Producing
a TOUGH HIDE
for the Weapons of War
The Rochester, N. Y., plant of Symington-Gould Corp., veteran producer of high grade steel castings, today is turning out a constant flow of cast steel armor for America's weapons of war.
To help speed its output Symington-Gould relies upon its Osborn moulding equipment.
At the right, top, is an Osborn Jolt Rollover Pattern Draw machine, No. 405-1, producing drag moulds.
Below it you see an Osborn Jolt Stripper No. 560, turning out cope moulds.
At the bottom is a view of these jobs ready to pour.
THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue
Cleveland, Ohio
OSBORN
MOULDING MACHINES

COMMENT

THE most encouraging development in a month marked by a flood of bad news from the war front is the awakening which seems to be taking place throughout the country. If one can judge by newspaper reports, public speakers and conversations here and there, many men and women in every walk of life are beginning to ask questions. At last we seem to realize the tremendous implications of the present emergency. Unless we can move faster toward an all out war effort, the day of final victory is pushed further and further into the future. We can lose the war if we do not face the task ahead with everything we have, both at home and at the far flung battle fronts.

On the home front, it is my impression that management is doing a much better job in converting to total war production than is either government or labor. Congress and various branches of the government are still doing things which indicate a lack of understanding of the needs of the hour. As an example, consider among other things, the matter of pensions for our senators and representatives, and the squabbles that have developed around civilian defense.

The other day I drove along the famous Outer Drive at Chicago where WPA work still is going on. While the sign announced a WPA-National Defense Project, the chief bit of work under way at that time consisted of planting many trees along the highway. At a time when manpower is needed and the cost of war is staggering, how can this activity be of any benefit to National security. These men, if not available for production work, could be used to guard plants and other vital points of the country. Our present complacency with regard to such protection may result in disaster.

In all too many cases, labor still wants to be excluded in paying its proportionate share of the war cost. If victory is to be ours, every one of us must work harder, and we must work more hours for the benefit of the common cause.

—□—

During the past month several important orders controlling various phases of foundry operations have been issued by the WPB, OPA, and other groups in Washington. The following are of especial interest:

According to Priorities Regulation No. 3, individual applications for preference ratings may be filed on the new PD-1A application blanks, and preference ratings assigned on Army and Navy contracts may be issued on Form PD-3A. In contrast with previous regulations, ratings assigned on the new PD-1A and PD-3A forms may be extended to suppliers and sub suppliers by the simple endorsement of the purchase order.

Amendment No. 1 to Steel Castings Price Schedule No. 41, issued on Feb. 4, 1942, fixes price ceilings for so-called railroad specialties, namely side frames, bolsters, couplers and yokes, at the levels prevailing on Oct. 1, 1941.

The OPA has sent letters to operators of nonferrous foundries asking that they not charge prices higher for castings than those prevailing between October 1 to 15, 1941. In making the announcement, the OPA stated the action was expected to stabilize prices charged on a wide range of castings produced by some 3000 enterprises in the industry doing an annual business approximating $500,000,000. Note that in indicating the method of determining the selling price of castings substantially different from those sold or offered for sale between October 1-15, 1941, the OPA gives this regulation "At a net price to you not in excess of that which you would have charged on Oct. 15, 1941, under the pricing formula then used by you, taking the same cost factors (i.e. wage rates, prices of materials, overhead, etc.) and profit margins which you have used on Oct. 15, *even though your costs have increased since that date.*" What possible justification can there be for that part of the regulation I have shown in italics?

Division of Industry Operations, War Production Board has issued Conservation Order M-1-e, which limits aluminum to only 15 uses. Aluminum may be used as a deoxidizer or alloying agent in the manufacture of steel, the total amount used in any month not to exceed 0.03 of 1 per cent by weight of the amount of carbon steel and 0.1 of 1 per cent by weight of the amount of alloy steel produced during such month. Only low grade aluminum which has not been debased shall be used for the purpose. Matchplates, patterns and snap flasks may be made, provided the customer certifies in writing to the manufacturer that this equipment will be used as an aid to manufacture where light weight and strength are essential in production of orders bearing A-1 or higher priority ratings. Only low grade aluminum which has not been debased may be used.

Suspension orders have been issued by the Division of Industry Operations, WPB, against several nonferrous foundries for violation of priority orders on aluminum scrap.

—□—

During the past several months many foundries have encountered considerable difficulty in providing priority ratings for the purchase of chaplets. At one time it was possible to obtain such material by using the repair maintenance order, but later a strict interpretation prevented such action.

A recent communication from W. R. Bean, chief, Foundry Equipment & Supplies Unit, War Production Board, states that Dean C. Gallagher, chief, Maintenance & Repairs Section, Production Requirements Branch, War Production Board has ruled that preference rating P-100 may be utilized in the purchase of chaplets. Mr. Gallagher states that all analysts of the PRP have been advised that foundry chaplets may be obtained through the medium of P-100.

—□—

The American Standards Association suggests that you "Let Your Competitor Make the Non-Standard Product." This seems to make sense, especially in time of emergency.

—□—

The other day I was given a special showing of the new technicolor sound movie of the Aluminum Co. of America, entitld "Unfinished Rainbows." This is a beautiful job, combining the historical with modern production methods of producing, rolling and casting aluminum. The film should make an excellent subject for chapter and local association programs. If your organization would like to request a showing, write to Douglas B. Hobbs, Aluminum Co. of America, Oliver Building, Pittsburgh.

—□—

The cover of this issue of THE FOUNDRY, with the interesting display of flags of the 26 nations signing the Unity Pact at Washington on Jan. 2, 1942, calls to mind that the Cleveland convention and Exhibition of the A.F.A. was to have been an International Foundry Congress, and many of these nations would have participated. May the time soon come when the foundrymen of these nations and those of the Western Hemisphere again may join in an International congress.

F. G. S.

NEW EQUIPMENT and Supplies

Electric Motor

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has placed on the market a newly developed electric motor which is claimed to possess numer-

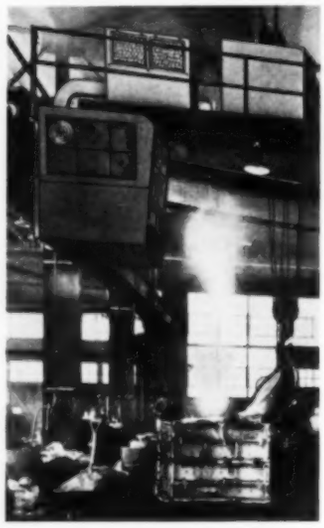
ous features of design and construction. One piece cast frame and cast end shields guard the motor from exterior knocks and abuse. A more liberal use of electrical materials makes the motor internally and electrically stronger because current and magnetic densities are less extreme. Improved bearing design delivers smoother performance with full flow lubrication and easier maintenance. Additional cross strength is built into the distortionless stator for maximum power efficiency. Motor is keyed to shaft and the outer surface is turned for smoothness and accurate air gap. Other features include oil drains at bottom of bearings, removable end brackets and large conduit box for handy wiring.

Vacuum Cleaner

Electric Vacuum Cleaner Co. Inc., Cleveland, has designed a heavy duty portable commercial-industrial vacuum cleaner, one horsepower, provided with an extensive list of special nozzles to meet practically any condition. It is claimed this sturdily built device requires practically no attention. Large swivel type ball bearing casters make movement easy. Side handles permit quick emptying. In operation the collected material is taken directly into a large capacity metal container. A special filter dries and cleans the air before it leaves the tank. This type of cleaner is available in two sizes, one 17 inches diameter, 22 inches deep, capacity 1½ bushels, weight 78 pounds; the other 20 inches diameter, 22 inches deep, capacity 2 bushels, weight 88 pounds.

Air Conditioner

The Lintern Corp., Berea, O., has developed air conditioning equipment for foundries and forges



designed to protect the crane operator against heat and cold and against fumes and dirt. For cranes handling hot metal it is claimed the equipment results in a temperature reduction up to 50 degrees Fahr. Automatic control prevents cold shock, but insures an effective temperature within the comfort zone. On crane cabs requiring an open window a cooling effect is obtained without drafts or the entrance of fumes, gas and heat. Installation is practical on new or old cranes. Filters are included on all models. A unique electric heater utilizes the same source of clean air for winter operation. Standard models with interchangeable parts supplied complete with electric and temperature control meet all mill and foundry requirements for service.

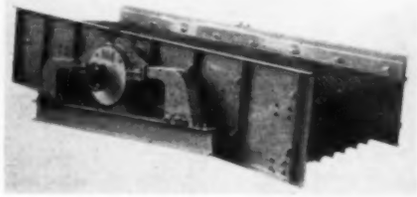
Mercury Lamp

General Electric Co. has developed what is claimed to be the largest and most powerful mercury lamp in the world. Rated at 120,000 lumens the 55-inch tubular light source is eight times more powerful than the present largest lamp of its kind. Trial installations show that these lamps in good reflectors and on conventional spacing centers provide more than 50 footcandles of light evenly over the working plane. The tube contains a small amount of argon gas and free mercury. When electricity passes into the lamp, the mercury vaporizes. An arc forms between the two electrodes. All light comes from the arc operating under comparatively high pressure. This lamp, as with all electric discharge lamps, requires a special transformer for proper operation.

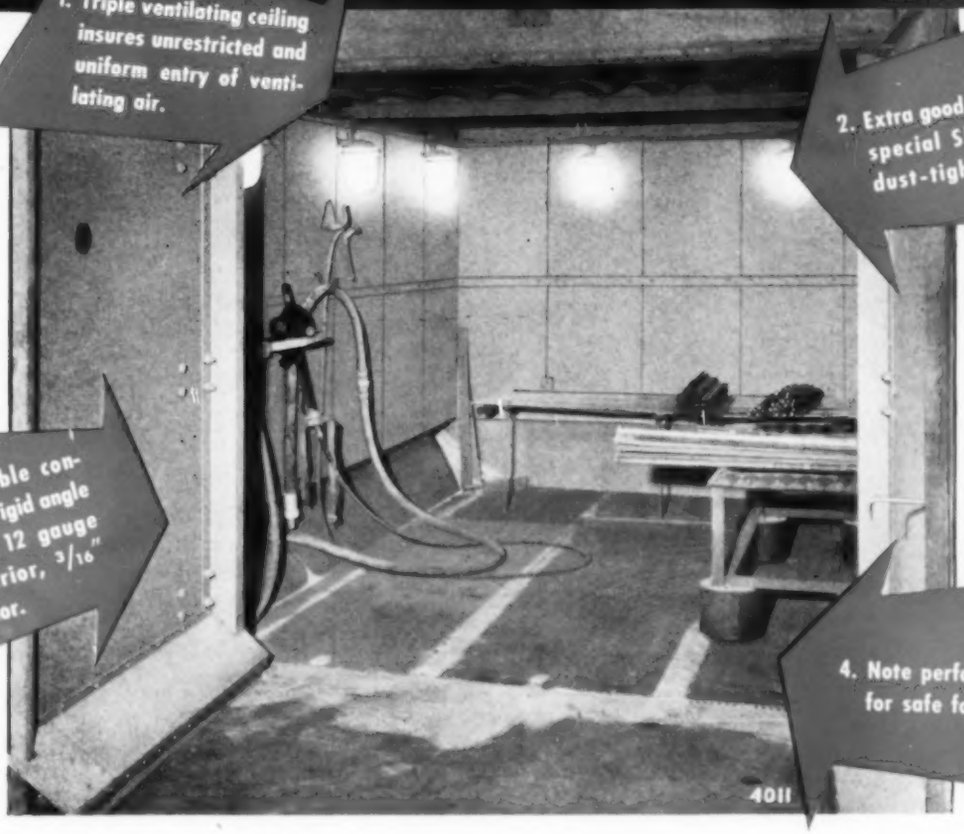
Vibrating Screen

Robins Conveying Belt Co., Passaic, N. J., has added to its line a new high speed, unbalanced pulley type vibrating screen designed to stand up to over loads. The new screen shown in the accompanying illustration has a number of features designed to save power, lubricant, screen cloth and general maintenance costs. Oil lubricated bearings are supersealed by double action flingers and completely welded

(*Continued on page* 102)



THESE *Exclusive* ADVANTAGES OF *SLY BLAST ROOMS* HELP GET *Top* PRODUCTION


1. Triple ventilating ceiling insures unrestricted and uniform entry of ventilating air.
2. Extra good light from special Sly sturdy, dust-tight fixtures.
3. Doors of double construction—a rigid angle iron frame, 12 gauge plate exterior, 3/16" plate interior.
4. Note perforated floor for safe footing.
4011

★ Sly blast rooms offer many advantages which account for their outstanding popularity and widespread use.

Better Ventilation. The ceiling is so constructed that downdraft ventilation takes place throughout the entire area.

Better Lighting. Plenty of the Sly special dust-proof fixtures give abundant illumination.

Sturdier Construction. 3/16" wear plates line all of the interior. These are easily replaceable.

Safer Construction. Grating and perforated plates—assembled in interchangeable sections—make an ideal floor—in safety and efficiency.

A *good* blast room is a *good* investment. Ask for Specification Sheets S-74 and S-75—benefit by Sly advantages.

THE W. W. SLY MFG. CO.

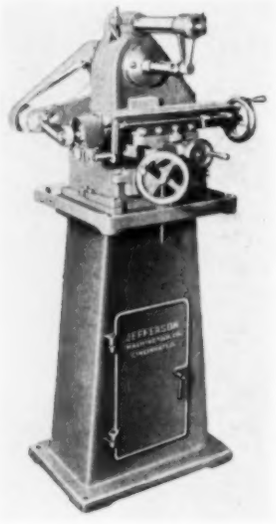
4753 Train Avenue Cleveland, Ohio

(*Continued from page* 100)

splash and dust guards. Inclination of screen, amplitude of vibration may be varied to obtain maximum flexibility of application. It is claimed screens are used all over the world to screen dozens of different materials. A complete range of sizes is available.

Milling Machine

Jefferson Machine Tool Co., Cincinnati, has designed a motor driven precision milling machine which is said to combine speedy and accurate production with ease of operation, long and hard service. The spindle is mounted in tapered bearings,



slides are dove tailed, gibbed and hand scraped. Gibs are adjustable for wear. The machine has a positive locking arrangement for table, knee and saddle. The table carries three slots for the clamping T-bolts. Accurately machined feed screws have dials graduated in thousandths of an inch. The vertical feed screw is operated by bevel gears. The power feed has a 3-step V-belt drive for each of the four spindles driven at 200, 400, 700 and 1000 revolutions per minute. A quick adjustment lever maintains constant maximum pull of belts and automatically releases with over load. The cabinet column provides storage space for collets and attachments.

Microphotometer

Leeds & Northrup Co., Philadelphia has developed a rapid, convenient method for analyzing spectrographic plates or films through a new recording microphotometer shown in the accompanying illustration. Plates and films are mechanically scanned by a motor-driven unit. Relative positions and densities of

spectrum lines are recorded automatically. Designed to accommodate plates or films up to 4 x 10 inches the unit includes on a heavy cast base, an optical system, a plate stage, a drive mechanism, an amplifier and the necessary controls. Pen position can be read at a glance on an indicating scale as the record is drawn. No unusual skill is required to operate this microphotometer.

Blackout Paint

American-Marietta Co., Chicago, recently has placed on the market a blackout paint for windows and sky lights. The paint is marketed in paste form. When cut 50 per cent with water can be sprayed or brushed on the glass. Coverage is claimed to be 800 square feet to the gallon. The paint dries within 40 minutes and provides a flat surface that will not flash or glare from artificial light within the room. In interior applications a single coat may be covered with white paint where large glass surfaces make the higher reflection properties of a white surface necessary. The paint may be removed without damage to the glass. It is packed in 1 and 5-gallon containers.

Tool Holder

M. E. Cunningham Co., Pittsburgh, recently has developed a safety adjustable hand tool holder, shown in the accompanying illustration for holding square or octagon shaped tools, from ¼ up to 1¼-inch. It is claimed this holder eliminates any danger from misplaced hammer blows, and also prevents the stamp or other tool from flying out of the grip. Another advantage is that clearer and more even impression can be secured because the tool or stamp is held squarely in place and if necessary can be hit harder. The holder can be furnished with leveler in front protruding at the proper angle for the operator to make several impressions in a straight line. The holder is a steel tube slotted in *V*-shape to hold the tool. A special coil spring on the inside is held in

place by a back plate. A smaller piece of tubing and a vulcanized rubber plug provides tension against the tool and prevents it from flying out of the holder. The holder is balanced and strengthened in the necessary spots to eliminate unusual wear.

Shows Temperature

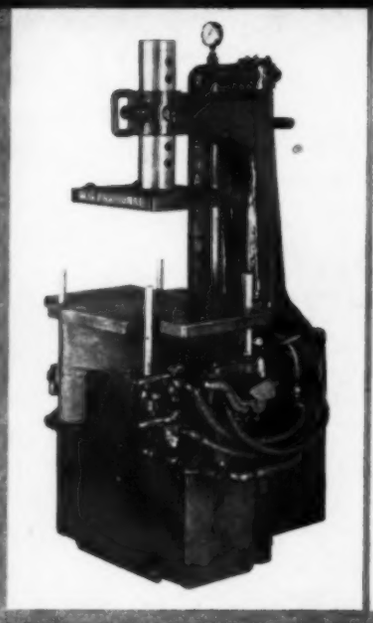
Tempil Corp., New York, is marketing stick products with specified melting points in a range between 125 and 1600 degrees Fahr. A stick designed for 300 degrees Fahr. drawn across a surface heated to less than 300 degrees Fahr., will leave a chalklike mark which melts into a liquid streak when the surface reaches 300 degrees. It is claimed the device provides a simple and convenient method of signalling desired preheating temperatures for all metal working operations requiring accurate control. Properly used each stick will yield up to 1000 temperature determinations on horizontal, overhead, vertical and inclined surfaces.

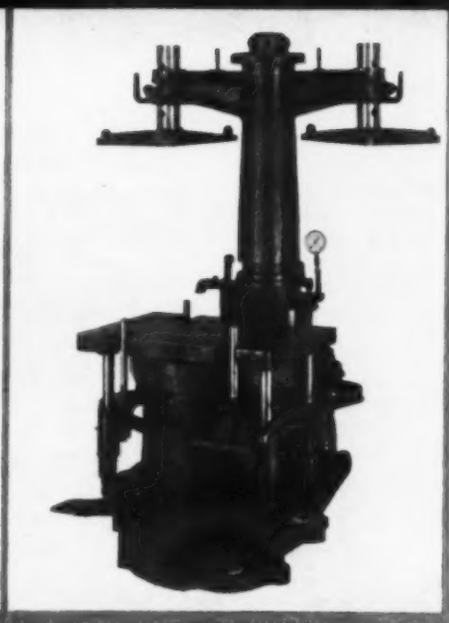
Carbide Tip Tools

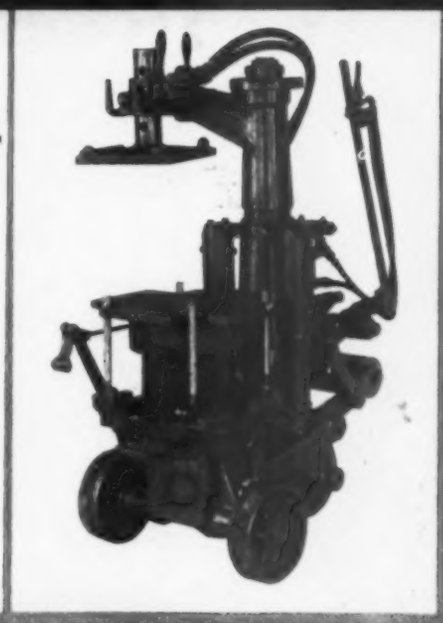
The McKenna Metals Co., Latrobe, Pa., is marketing new styles of carbide tipped tools specially designed for interrupted cutting of steel castings and forgings in machine tools. They are designed to speed up production of armor plate, tank parts

(*Continued on page* 104)

INTERNATIONAL MOLDING MACHINES





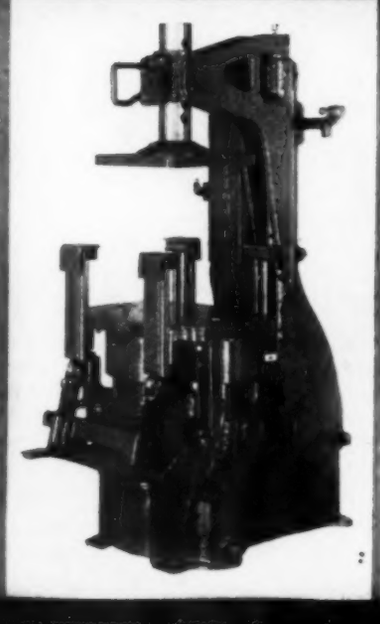


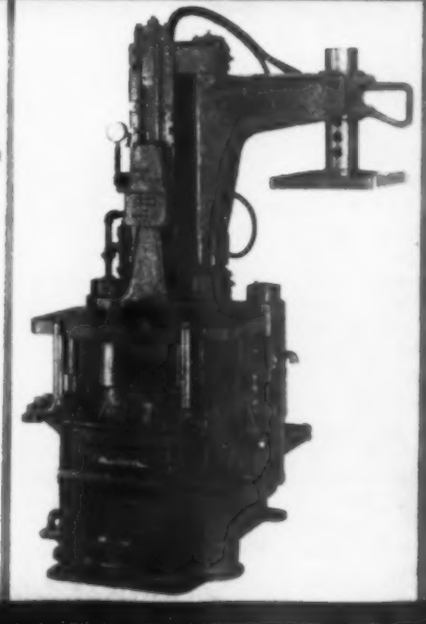
All of the 70 different types of machines that we build are made in a wide range of sizes. Each type is made in a variety of designs. The six machines illustrated are representative of our line of

JOLT SQUEEZE LIFT and STRIP MACHINES

used for copes on *high production* work in combination with our various types of JOLT TURNOVER DRAW and JOLT SQUEEZE TURNOVER machines for drags.

INTERNATIONAL Blowers are used in *high speed* shops for blowing cores weighing from 1 oz. up to 250 lbs. and over.



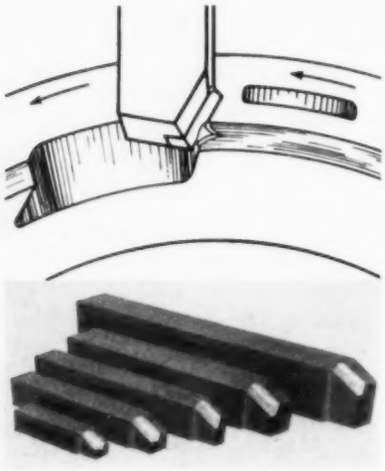


INTERNATIONAL MOLDING MACHINE CO.

2608--2624 W. 16th St., CHICAGO, ILLINOIS

(*Continued from page* 102)

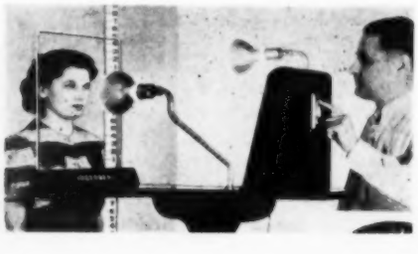
and other irregular shapes. It is claimed the new tools with the negative shear angle of 35 degrees combined with a positive side rake of



15 degrees show marked economy in operation. The principle on which the tools are built is that interruption on the work first strikes the tool at a place back of the extreme point, where the cutting edge is mechanically strong and then shears the chip with a progressive action. Tools are left and right. Tips are longer than on other tools to compensate for the foreshortening of the 35 degree angle. Tips project above the shank at the back to allow sufficient steel under the point.

Identification

Photographic Equipment Inc., Pittsburgh, is prepared to supply camera equipment and service to any type of organization requiring means of identifying employes. The camera with pedestal occupies floor space 2 x 3 feet and is equipped with castors. Complete weight 57 pounds. It is ready for operation when the connection is plugged into a light socket. Cartridges are the regular 35 mm motion picture film obtainable at any photographic supply station. A scale registers the height and additional information, weight, color of hair and eyes, etc., readily can be included. The equipment may be operated by a plant employe.



Belt Grinder

The Porter-Cable Machine Co., Syracuse, N. Y., is making a small abrasive belt sander grinder with a belt 4 inches wide and 45 inches circumference. The grinder may be used with dry belts or with the new type resin bonded abrasive belt. A ¾-horsepower, 1725 revolutions per minute, ball bearing, totally enclosed motor directly connected to the drive pulley gives a belt speed of 3400 feet surface speed per minute, traveling over a flat backing plate 4 inches wide, 10 inches in length. Two hand adjustments simplify the application, removal and alignment of the abrasive belts. Mounted on a light, substantial cast iron pedestal, the machine is readily portable. The slotted rest table is adjustable up to a 45 degree angle. Change from vertical to horizontal,

or even horizontal with the belt underneath can be made quickly by removing three bolts.

Foam Mixer

American-LaFrance-Foamite Corp., Elmira, N. Y., recently has placed on the market a new foam mixing chamber designed for easy installation on modern oil storage tanks of the pressure type. The device is used to provide a blanket of fire smothering foam to burning oil surfaces. Inspection cap can be removed to inspect a diaphragm without releasing tank pressure. The vapor proof glass diaphragm prevents vapors in tanks from entering the mixing chamber, from entering or condensing in chemical solution lines, or from escaping. Glazed in a metal frame the diaphragm holds gas tank pressure, yet ruptures fully under foam pressure. The chamber is of expansion type design with increasing cross sectional area to insure intimate mixing of chemical solutions, efficient formation of foam and low velocity delivery. A small hole in bottom plate allows air to circulate to retard corrosion, provide drainage, and act as tell tale upon foam discharge.

Heat Lamp

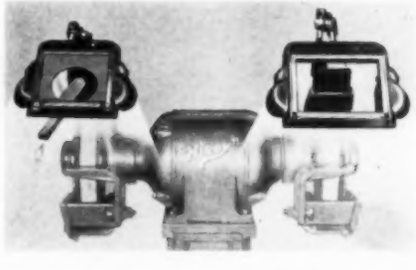
Wabash Appliance Corp., Brooklyn, N. Y., through the Birdseye Research Laboratories has developed a new infra-red tungsten heat

lamp shown in the accompanying illustration. The new bulb is designed to use what engineers know as spilled heat. The new bulb has a pure silver ring lining sealed inside at a point just below the focal point. The silver ring leaves a clear bullseye spot through which heat beams are projected direct from the filament to the heating area without any loss. All remaining heat rays are projected down to the heating area. The new lamp is available in 250 watt size, tungsten filament only, will fit in standard socket, and has an average burning life of 5000 hours.

Grinder Accessories

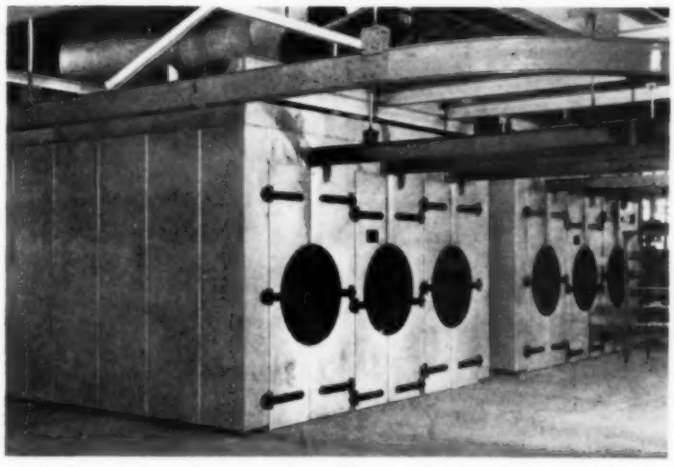
The Hisey-Wolf Machine Co., Cincinnati, is making a wide range of attachments and accessories for grinding machines, including an eye-shield shown in the accompanying illustration. The list includes tapered extension spindles; wheel dressers; disk grinder dresser; safety tapered flanges; combination brake and switch; two wheel spindle extension; dust collection hoods; ring wheel chuck; twist drill grinding attachment; combination ex-

(*Concluded on page* 107)



BAKE CORES, DRY MOLDS *with* SPEED *and* SAFETY *in*

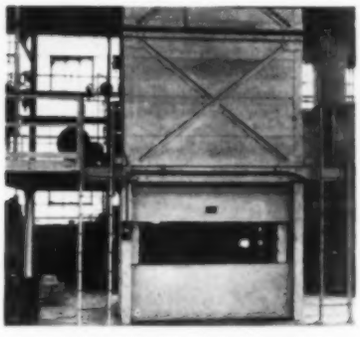
CARL-MAYER OVENS



Part of a battery of twelve Carl-Mayer Gas Fired Recirculating Type Core Ovens, in an outstanding foundry, featuring amazing uniformity only achievable with a Carl-Mayer heating system.

Over twenty years' experience, brim full of achievements in foundry oven design and construction, has won recognition of leading foundries (see names below) for outstanding contributions to speed, efficiency and fuel saving in core baking and mold drying.

Repeat orders are proof! And they average more than three per customer.



Typical large Carl-Mayer Vertical Core Oven as installed for Electric Autolite, Fremont Foundry, Cadillac, General Motors and Packard Motor Co. It is the only truly re-circulating air heater type vertical oven of its kind.

•

WE BUILD ALL TYPES OF FOUNDRY OVENS — Drawer, Shelf, Vertical, Horizontal Conveyor, etc. from the smallest to the largest and for any fuel. Wire for immediate consultation with a Carl-Mayer Engineer . . . . Illustrated Bulletin on request.

THE CARL-MAYER CORPORATION
3030 Euclid Ave., Cleveland, O.

CARL-MAYER CORE AND MOLD OVENS SERVE CONCERNS LIKE THESE:

ALUMINUM CO. OF AMERICA
AMERICAN MAGNESIUM CORP.
AMERICAN RADIATOR CO.
BABCOCK & WILCOX CO.
BUCYRUS-ERIE CO.
BROWN INDUSTRIES CORP.
DUNKIRK RADIATOR CO.
ECLIPSE AVIATION DIVISION OF BENDIX AVIATION CORP.
ELECTRIC AUTOLITE CO.
FORD MOTOR CO.
FOX FURNACE CO.
FORT PITT STEEL CASTING CO.
FRANK FOUNDRIES CORP.
FREMONT FOUNDRY CO.
G & C FOUNDRY CO.
GENERAL MOTORS CORP.
GENERAL ELECTRIC CO.
GILBERT & BARKER CO.
INTERNATIONAL HEATER CO.
LECTROMELT STEEL CASTING CO.
OHIO INJECTOR CO.
PACKARD MOTOR CO.
SHENANGO PENN MOLD CO.
STUDEBAKER CORP.
UNION METAL & MFG. CO.
WHITEN MACHINE WORKS
WHITING CORP.

AN OLD FAVORITE

MAKES A GREAT COMEBACK!

THE CLIMAX WIRE STRAIGHTENER

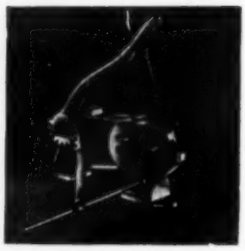
● For years the Climax enjoyed the reputation of the favorite of foundries but never did it enjoy the spectacular growth it's had in the past year.

We can't take all the credit for this rise in popularity—part of it is due to years of service by the Climax Wire Straightener in hundreds of foundries all over the country and part, of course, to the fact that never, since World War I, has it been so in tune with the times to conserve wherever you can.

The fact remains, however, that the Climax of today is better than ever before. The Climax of today is easy to buy and to operate. Oversize dust-proofed bearings, enclosed gears and a new steel for the rolls and bushings ensure a long life with a minimum of maintenance. The Climax is offered in three models to handle all wire sizes. It can be had with extended shaft for your belt drive, with complete V-belt drive or with gear reducer with flexible couplings.

If you want to conserve core wires, save money, and help win this war, get the information on the Climax Wire Straightener today!

THE WONDER CUTTER



Cuts soft rod or wire up to ⅝" dia. and band iron up to ⅛" x 2". Gauge for repeated cuts to same length. Sturdy and long-lived. The lowest priced Wire and Band Cutter on the market!

THE LOWE RIDDLE

The sifter with everything! You can put 6 tons of oil-based core sand through a Lowe every hour! Low first cost and practically no maintenance. Fully guaranteed. It will pay you to use a Lowe sifter.

THE FEDERAL FOUNDRY SUPPLY CO.

4600 EAST 71st STREET, CLEVELAND, OHIO

CHICAGO—CHARLEROI, PA.—CHATTANOOGA, TENN.—DETROIT—MILWAUKEE—MINNEAPOLIS—NEW YORK—RICHMOND, VA.—ST. LOUIS—UPTON, WYO.

(*Concluded from page* 104)
hauster and filter; and exhauster without filter.

Caps and Masks

Modern Industrial Products, New York, is producing a new line of caps and masks to protect industrial workers from smoke, fumes and dust. It is claimed the largest pore in this vegetable fiber product

is 0.0029 square millimeters and lintless. It is stated the cap and mask are recommended by industrial physicians, safety engineers and plant managers for protection against all nontoxic, silica free nuisance dust. For a slight additional charge the masks are available with a medicated preparation to safe guard against colds. The caps are light, cool and comfortable and may be boiled for repeated use.

Paint for Blackout

The Midland Paint & Varnish Co., Cleveland has developed a black out paint which it is claimed meets all the requirements for ease of application, obscuring of light and reflections, simplicity of removal and economy. The paint for outside application dries in from 30 to 40 minutes to a self leveling dull flat surface. It can be brushed on, or thinned for spraying. Average coverage is claimed to be 550 square feet per gallon. It is stated that the paint is heat resistant, unaffected by sun rays, summer heat, or high heat in certain types of manufacturing establishments. It is not affected by moisture, rain, sleet, snow or exhaust steam. The paint is easily removed with an inexpensive solvent.

Welding Unit

The Harnischfeger Corp., Milwaukee has introduced two new gas driven welder units with capacities of 15 to 200 amperes and 30 to 260 amperes respectively. Equipped with the latest type self-contained welding generators they are powered by a direct connected heavy duty, 4 cycle, 4 cylinder, V-type gasoline engine. These units are mounted on pneumatic tired trailers with low centers of gravity to permit towing at normal traffic speeds. The wide welding ranges, single current positive power controls and mobility of these units suit them ideally for portable use. Hinged side panels affording ready access to generator and engine, may be swung up and locked in place when necessary. Recessed compartments under the canopy provide ample room for storage of cables, tools, welding rods; etc.

Nonferrous Casting Prices Stabilized

Letters were sent on Feb. 3 to operators of foundries making nonferrous castings asking them not to charge prices higher than those prevailing between October 1-15, 1941, according to Leon Henderson, administrator, OPA. This action is expected to stabilize prices charged on a wide range of castings by some 3000 enterprises in the industry, doing an annual business approximating $500,000,000. The letter follows:

To All Nonferrous Foundries

In the light of recent events it is not necessary to emphasize to you the strategic position nonferrous foundry products occupy in our war program. The nonferrous metals, together with steel, are among the most important materials required to win the war. Foundry products are essential to the manufacture of planes, tanks, ships and guns.

This Office has been charged with the task of price stabilization. Price increases and inflationary spirals disruptive to our war effort cannot be permitted. To a large extent, the raw materials used by foundries have been stabilized in price. As yet, nonferrous foundry products have not been subjected to price control.

Preliminary study of recent price movements for the products of nonferrous foundries indicates the need of prompt action. An informal method of control appears to be preferable to mandatory action and the Office of Price Administration will proceed on this basis as long as possible.

With this in view, you are requested on or after February 1, 1942 regardless of any contract or sale or other commitment except as hereafter specifically provided, to sell, offer to sell or deliver nonferrous castings only in accordance with the following price limitations:

(a) *Castings substantially the same as those sold or offered for sale between October* 1-15, 1941.

At a net price to you not in excess of the highest price at which you sold or offered to sell such castings during the period, October 1-15, 1941.

(b) *Castings substantially different from those sold or offered for sale between October* 1-15, 1941.

At a net price to you not in excess of that which you would have charged on October 15, 1941, under the pricing formula then used by you, taking the same cost factors (i.e., wage rates, prices of materials, overhead, etc.) and profit margins which you have used on October 15, even though your costs have increased since that date.

Nothing said theretofore shall apply to deliveries under contracts made prior to February 1, 1942, provided that deliveries under such contracts are completed before March 1, 1942.

The foregoing restrictions upon the net selling price realized by the manufacturer determine only the maximum price. It is understood that prices below the maximum may be quoted and charged.

The term "nonferrous castings" shall include all castings made in sand, semi-permanent or permanent molds poured at atmospheric pressure from aluminum, antimony, bismuth, cadmium, cobalt, copper, lead, magnesium, nickel, beryllium, tin, zinc, and their alloys where any one or any combination of the above metals equals or exceeds fifty percentum (50%) by weight of the total metal content, and suitable for use or further fabrication without remelting.

You are requested to file with this Office on or before March 15, 1942 an affirmation of compliance, and on or before the 15th of June, September, and December a renewed affirmation of compliance. Copies of the forms to be used are enclosed.

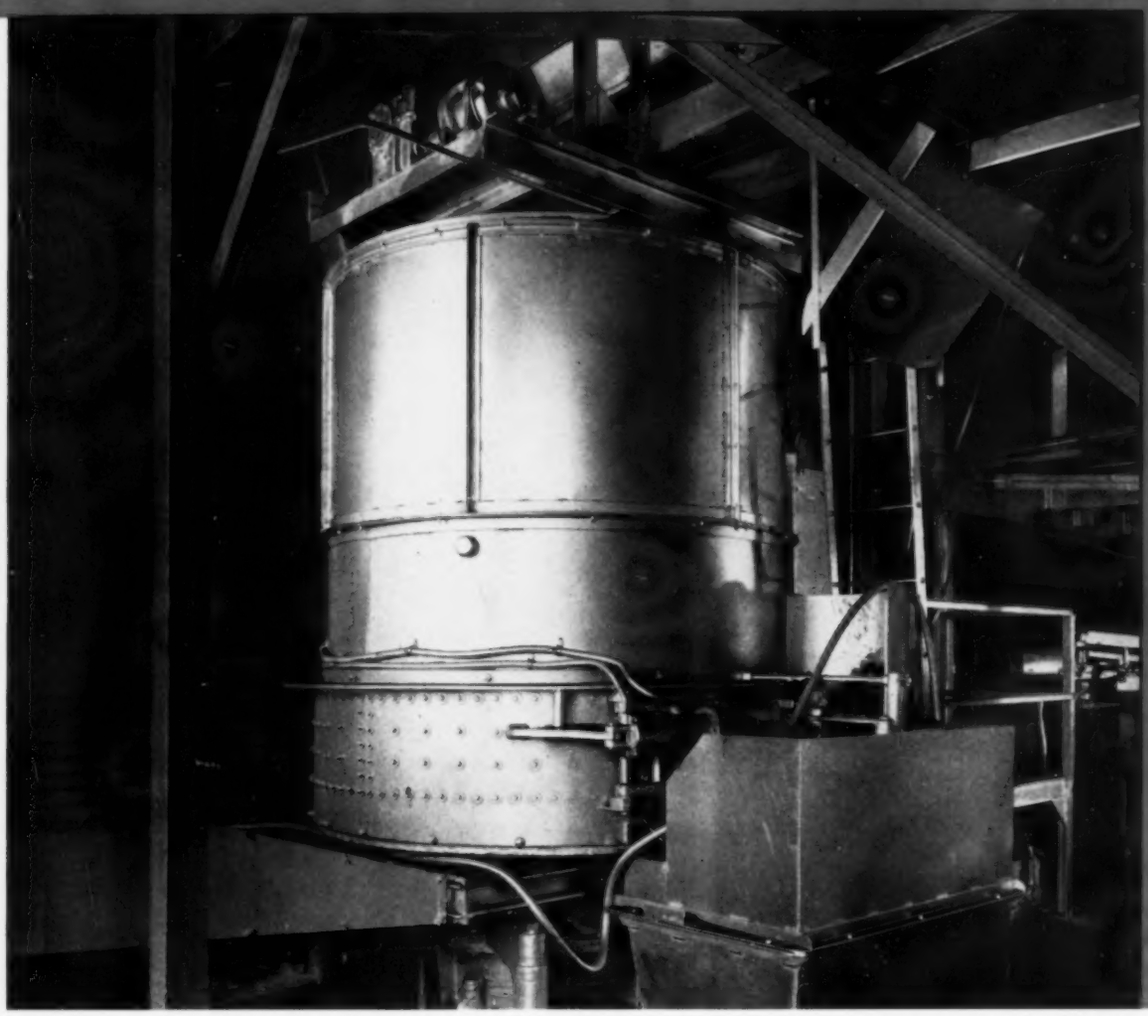
If compliance with the above request appears to work undue hardship on your company, you have the right to apply to this Office for relief. In order to determine the need for such relief, complete cost and profit data must be filed with this Office. When this information has been supplied, this Office will grant such relief as it deems justified.

In order that we may have an understanding of your business, we request that you fill out and return the enclosed questionnaire by Feb. 15, 1942. If certain data cannot be determined exactly, please use estimated figures and so indicate.

It is planned to hold shortly a series of regional meetings for the purpose of discussing this request and the problems confronting your industry. You will be invited to attend one of these regional meetings.

Please acknowledge receipt of this letter.

A dozen reasons why . . .



Completely automatic Model 70 *Speedmullor* with air cooling at Caterpillar Tractor Company, Peoria, Illinois.

SPEEDMULLORS . . .

1 No other single piece of equipment can do the same complete job as the Beardsley & Piper Co.'s *Speedmullor* 2 A 1½ minute maximum cycle will remove fines, mull and cool sand from the highest temperatures to 5 degrees above room temperature 3 More accurate sand control 4 Save oils and binders 5 Require less floor space 6 Deliver more flowable and more rammable sand as attested to by hundreds of installations in leading foundries of all kinds throughout America. Ask a *Speedmullor* user. He'll give you the facts.

THE BEARDSLEY & PIPER COMPANY

. . . hundreds of users *prefer*

Stationary Type *Speedslinger* at Kaukauna Machine Corporation, Kaukauna, Wisconsin

SPEEDSLINGERS . . .

1 Double the production from your present jobbing floor space 2 More flexible for ramming molds of all sizes from snaps to the largest pit molds 3 Rams a more secure mold than any other machine in the world, requiring less gaggers and bars 4 Standard *Speedslingers* (not special) will ram 1,000,000 pounds of sand every eight hours without overloading 5 Lowest cost for ramming ever known. Savings of $300 in 8 hours are not uncommon 6 You can teach a man, woman or child to operate the *Speedslinger* efficiently in 24 hours.

2541 North KEELER Avenue · CHICAGO

READER'S COMMENT

Readers are invited to comment upon articles and other editorial material appearing in THE FOUNDRY. *The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief.*

THE EDITORS

Use Uneven Number

TO THE EDITORS:

On page 73 of your February issue under title "Cast Iron Gear Wheel Cracks Through Web and Arms," is an interesting article about trouble encountered in cracks through the web and arms of the gear.

In connection with a chain sheave we had somewhat similar trouble with a six arm design. After changing our pattern to a five arm design we overcame the cracking of these parts entirely. It seems that an uneven number of arms sort of compensates for some of the uneven shrinkage which occurs. Possibly the use of seven arms in this particular case would be better because of the large size of the gear.

Of course, the difference in the thickness of sections is a heavy contributing factor.

C. E. SHIRMER
Chief Engineer
Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio

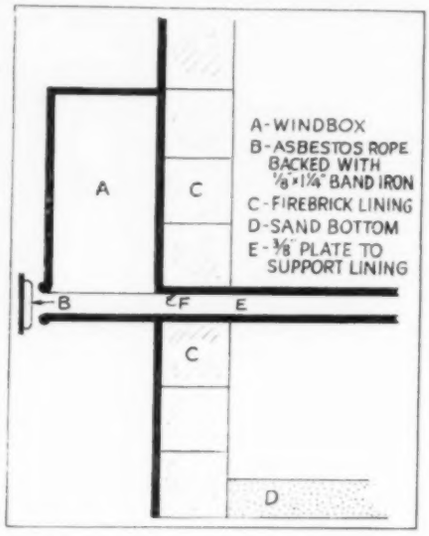
Uses Small Cupola

TO THE EDITORS:

In the August, 1941 issue we read a description of a small cupola used at the University of Minnesota by Fulton Holtby, and the thought occurred to us that you might be interested in a somewhat larger cupola which has been operated at the State College of Washington, Pullman, Wash., for the past 12 years.

The cupola is unusual in that it has a continuous tuyere which can be varied in size, just at the top of the crucible. The stack proper which holds the brick lining is supported by the charging floor. After dropping the bottom and cleaning up, the asbestos rope around the bottom of the windbox is loosened and the crucible is run out from under the stack on a little track. The cupola is lined to 24 inches.

By running the crucible out from under the stack, patching the lining is facilitated, and also it makes it easy to put in the breast and sand bottom. Each leg of the crucible contains a jack screw; making it easy to raise or lower it to vary the amount of air. We daub the asbestos rope around the windbox after tightening it up with a turnbuckle which is welded to the ⅛-inch band iron. The mud seals up any air leakage. Some details of construction



Sketch indicating various details of the arrangement of a small cupola

are shown in the accompanying sketch.

H. H. MONTGOMERY
Instructor
Machine Shop and Foundry
State College of Washington
Pullman, Wash.

Of Practical Value

TO THE EDITORS:

We are very much interested in the article entitled "Gating and Molding Malleable Cast Iron" by C. C. Lawson of Wagner Malleable Iron Co. We think this is the type of information that has a good deal of practical value, and the general dissemination of such information is especially valuable to designers.

We were once quite seriously criticized by one of our customers because we thickened up some of the ribs for feeding action such as discussed in this article. This customer happened to have had in an efficiency or designing engineer who apparently had no knowledge of feeding castings, and he indicated to the customer that this was done by the foundries to add weight and thus increase sales.

We would like to suggest that this type of article be repeated, but to make it of utmost value to the foundry, it would be very helpful if the same castings were shown attached to the gates, at the same time giving information as to the size of the gates and feeders, method of putting in the mold, together with size of the flask required. On of our men suggested that it would make a valuable compilation if a few of these were published each month, with detailed information on the gates and feeders, etc., as mentioned above, and these could be cut from the magazines and later bound. We make this suggestion for your consideration.

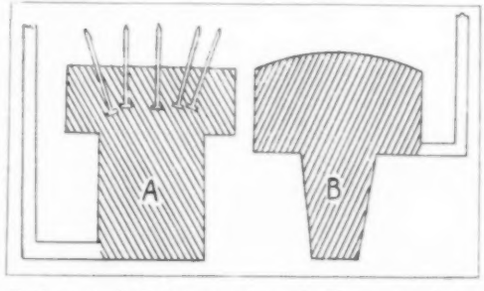
C. M. LEWIS,
Secretary and Treasurer
Badger Malleable & Mfg. Co.,
South Milwaukee, Wis.

Stamps and Shoes

TO THE EDITORS:

One of the items in the question and answer section of THE FOUNDRY for January dealt with the stamps and shoes employed for crushing gold bearing quartz in stamp mills, usually known as mortar boxes. These castings were made extensively in Pacific coast foundries in the days when stamp mills were almost as numerous as hot dog stands are at present. The castings were white iron and were molded and cast in the position shown in the accompanying illustration. A number of rods or spikes inserted in the cope face of the die or shoe mold *A* and extending into the mold cavity served to cool and hold the metal up. A different technique was practiced to secure a flat top on the stamp *B*. A curved top ¾-inch thick in the center provided extra metal to compensate for shrinkage. Shortly after the castings were poured, the copes carefully were lifted and any loose sand was brushed from this curved top on the castings. All hands and the cook were called into action. With the butt end of their rammers the men ironed down the hump with a nice, easy circular motion. By the time the iron had set, the top surface was flat and even. The gating method shown, has certain commendable features. The rammer butts were a little on the large side and were kept clean and smooth. A thin film of sand between the butt and the casting is advisable.

LEONARD SCHAD
Portland, Ore.



Spikes cooled the metal in A. The curved top in B was ironed down with the butt end of a rammer

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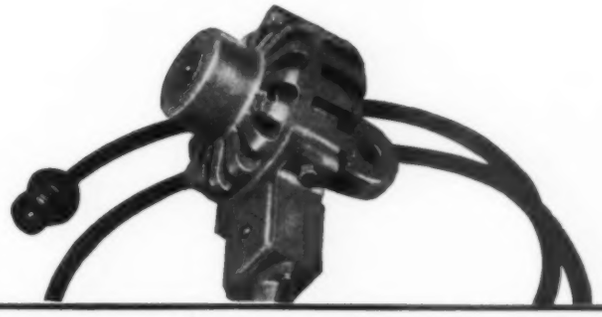

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True-to-pattern castings make satisfied customers . . . more repeat business. Increase your production and castings quality with RED Electric Vibrators. Sturdy, dustproof, lowest operating cost (electricity does not freeze). Unequaled for consistent year-'round results in foundries all over the world.

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No. 1—Light match plate work	$10.00	No. 5—Heavy match plate, tub, bench	$17.00
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Activities of FOUNDRY GROUPS

Chesapeake

REAL satisfaction can be achieved when one can discuss a pet theory, practice or difficulty with a group of men who are all in the same boat and have the same difficulty. Such was the case at the round table discussions held by the Chesapeake Chapter at its regular meeting on Jan. 23. A short business session was held immediately after dinner, after which the gray iron, steel and nonferrous members divided into groups and each member had the opportunity to ask questions or give information about each other's problems.

The interest shown at these discussions is plainly visible in the accompanying illustrations of the groups which were snapped during the meeting. R. T. Covington, foundry superintendent, American Hammered Piston Ring Division, Koppers Co., headed the table discussing gray iron castings; J. E. Crown, Naval Gun Factory, and vice chairman of the chapter, headed the table discussing steel castings; and E. W. Horlebein, Gibson & Kirk Co., chapter chairman, headed the table discussing nonferrous castings. Many important and interesting points were brought out by the members, and those who attended enjoyed a profitable and pleasant evening.—*Frederick Bruggman, chapter reporter.*

Pittsburgh

RATIONAL treatment of the raw material problems of the foundry industry must be accomplished soon if the industry is to give its best in the war effort, according to W. W. Rose, Gray Iron Founders' Society, speaking at the January meeting of the Pittsburgh Foundrymen's Association.

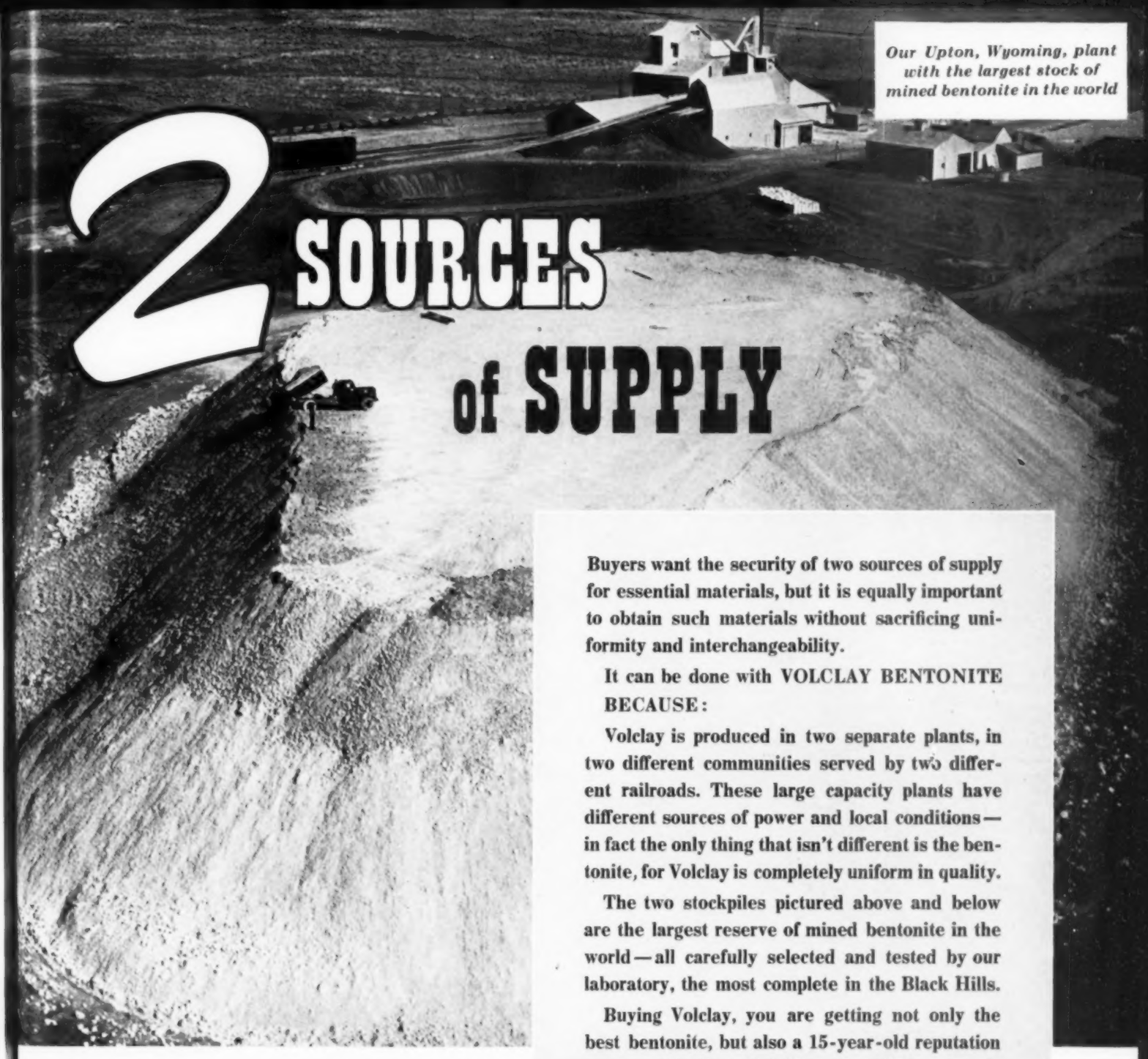
Mr. Rose emphasized the need for a confiscatory scrap search, and outlined the job that certain factors in the industry, including his own organization, are going to further this job in Washington councils. Outlying the job to be done, he indicated that technical assistance is being made available for the service branches in order to show when castings might be used to best advantage insofar as speed in our defense program is concerned.

There are many other jobs which need to be done to correlate the capacity of American foundries with the needs of America's war effort. Some of these and especial applications for production of military and naval equipment, educating military designers to use castings where most economical, educating foundrymen themselves in the best methods of securing the exact tolerances needed in war materiel; securing proper ratings for foundries to insure flow of materials and supplies with which to do the job.

Mr. Rose also outlined the procedure being used under the priorities system on iron and on scrap, and answered several questions regarding details of this operation. The association voted to appropriate $500 for the American Red Cross, and $2000 for the purchase of defense bonds in the name of the Pittsburgh Foundrymen's Association. Death of a former president of the association, J. W. Guay, on Jan. 17, was also announced. The March meeting of the association

(Continued on page 114)

Chesapeake Chapter meeting on Jan. 23. Cast steel group at upper left was headed by J. E. Crown, Naval Gun Factory. Nonferrous group at upper right was directed by E. W. Horlebein, Gibson & Kirk Co. At lower left are visitors from left to right—E. K. Smith, Army Ordnance Department, Washington; E. P. Strothman, Pangborn Corp., Hagerstown, Md.; John Leys, Lynchburg Foundry Co., Lynchburg, Va., and S. M. Brah, Rustless Iron & Steel Co., Baltimore. Cast iron group lower right under R. T. Covington, American Hammered Piston Ring Co., Baltimore. Photos by Frederick Bruggman, Gibson & Kirk Co., Baltimore



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It can be done with VOLCLAY BENTONITE BECAUSE:

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VOLCLAY *Bentonite*

American Colloid Company

CHICAGO

Another large stock pile at our Belle Fourche, South Dakota plant

(*Continued from page* 112)

will feature a discussion of alloys by R. C. Good, Electro-Metallurgical Sales Corp.—*R. L. Hartford.*

Cincinnati

PRIORITIES was the subject under discussion at the Feb. 10 meeting of the Cincinnati District Chapter which was held at the Cincinnati Union Terminal restaurant. Sixty members and guests were present and William Ball Jr., chairman of the chapter, presided.

Board of directors met at 5 for the privilege of meeting the American Foundrymen's Association national vice president, D. P. Forbes, and to receive his message from the national office and to confer with him regarding future development of the chapter. Mr. Forbes was presented by Chairman Ball at the regular meting and he gave a delightful and informal after dinner talk on various benefits from A. F. A. activities.

Because all of the foundries in the Cincinnati district are operating under priority regulations, the members had a personal interest in the subject which was ably discussed by C. E. Meyers, representative of Priorities Field Service, Cincinnati office of the WPB. Some of the phases which Mr. Meyers discussed were the three general headings: Priorities, why we have them and how they work; compliance, that is, the enforcement of priority regulations; exporting, use of licenses, etc. The variety of problems was illustrated by the number of questions. Mr. Meyers' talk occupied approximately 30 minutes and the question and answer period about an hour—*Henry M. Wood, secretary.*

Central New York

JANUARY meeting of the Central New York Chapter was held Jan. 9, at the Onondaga Hotel, Syracuse, N. Y. About 70 members and guests were present. After the dinner Lloyd Wright, chapter chairman, called the meeting to order and in commenting on the Christmas party held in December, expressed his appreciation to the committee for their efforts in making the party a success. He announced that there would be no meeting in February, but that there would be a meeting in June. He also announced that the March meeting would be held in Ithaca. The membership drive, was mentioned and the chairman urged all members to contact prospective members as the chapter should do its part.

Mr. Wright then introduced Guy A. Pealer, patternmaking superintendent, Elmira Foundry Co., who spoke to the group on "Pattern Making." Mr. Pealer used the patterns exhibited at the last American Foundrymen's Association convention apprenticeship competition as well as patterns from the Elmira foundry during his talk. He discussed the merits of the various methods employed by the contestants in planning the patterns, at the same time following in some detail a paper by Frank C. Cech which recently appeared in the *American Foundryman* regarding the same pattern exhibit.

Several points about the relative merits of various patterns brought out a lively discussion. Mr. Pealer suggested that any patternmakers who had not investigated the possibility of using prestwood and plywood whenever possible in pattern construction and also casein glue were overlooking a bet. Another point emphasized by him was consulting with the foundry foreman on patterns before going ahead with their construction.

The meeting was very interesting and the chapter is fortunate in having as a member a man of Mr. Pealer's ability.—*L. E. Hall, secretary.*

Reading

REGULAR meeting of the Reading Foundrymen's Association held at the Berkshire Hotel, Jan. 20, was a "double feature" meeting. The speaker was David Tamor, metallurgist, American Chain & Cable Co., York, Pa. and his subject was "Shrinkage in Brass and Bronze Castings." Mr. Tamor gave a talk complete on all phases of brass and bronze casting practice affecting shrinkage, tracing through the various operation from pattern design, gating and risers, molding, melting, pressure of risers and heads, pouring and proper supervision during all operations. A lengthy open discussion was held after Mr. Tamor's discussion during which numerous questions were asked covering the many points in his talk and the answers proved as valuable to the many ferrous men present as to the nonferrous men.

Following the discussion period a colored film entitled "Unfinished Rainbows" was shown, through the courtesy of the Aluminum Co. of America. Samuel K. Bushnell, representative of the Aluminum company made a few remarks about the film. Everyone present agreed it was one of the finest of its kind which the Reading group has been privileged to see, and it held the intense interest of the audience throughout the entire showing.

The president appointed the following committees for the year 1942: Speakers committee, J. M. Robb Jr., chairman, Herman Mandel; membership committee, C. H. Mundell, chairman, R. B. Harrison, H. G. Stults, B. S. Reed, J. Hatten; entertainment committee, H. P. Good, chairman, C. L. Bates, L. E. Bilger, M. G. Moore, William M. Davies; auditing committee, S. J. Wagner, E. K. Mark, William Davies.

The entertainment committee reported that the annual Christmas party was a financial success, as well as the largest and best party the association has had to date with an attendance of 475.—*H. C. Cummings, secretary.*

Connecticut

TWO hundred forty-sixth meeting of the Connecticut Foundrymen's Association was held at the Home Club, Meriden, Conn., Jan. 23. Robert Mills, president of the association, introduced the speaker of the evening, Howard J. Stagg, tool steels sales and research, Halcomb Steel Co., Syracuse, N. Y. Mr. Stagg gave a very interesting talk on chisel steels with particular emphasis on the uses of the different analyses of chisel steels to hot and cold work. The speaker roughly divided chisel steels into three general types: Silico-manganese, chrome vanadium and 3½ per cent tungsten. He recommended the use of either the silico-manganese or the chrome-vanadium types for working on cold castings, whereas the tungsten type proved its value when used where hot castings had to be chipped.

Mr. Stagg also paid tribute to the old-time blacksmith and pointed out no matter what the analysis of the chisel, it was no better than the blacksmith who forged it and the hardener who had heat treated it. The forging ranges on chisels are relatively narrow and a chisel should not be forged below a cherry red color. That would be approximately 1450 to 1500 degrees Fahr. depending upon the analysis of the material forged.

The speaker pointed out two methods of hardening chisels: One is to buy a chisel hardened all over and drawn at approximately 600 degrees Fahr. That chisel could then be hardened by the user by putting the tip in lead at about 1550 to 1600 degrees Fahr. and quenching in water or oil. The chisel would then be drawn in a salt bath to the desired hardness which would be 55-58 Rockwell C. The other method would be to take the chisel hardened all over and drawn at 350 to 400 degrees Fahr. The whole chisel with the exception of the tip would then be in-

(*Continued on page* 116)

for Victory!

FANNER SUPERCHILLS

(Patented)

No small part in the Victory program has fallen to Fanner Superchills.

When foundry production has been doubled and tripled to overcome the possibility of there being "too little too late"—when production minutes and methods count as they never did before—*when even the loss of a single casting for want of proper cooling* seriously affects the speed of the all-out effort . . . Fanner Superchills take on the importance of an absolute "must" wherever castings are made.

Our engineering staff is at your service at all times in helping you make better castings faster and more economically through the use of the proper Fanner Superchills, Chills and Chaplets.

THE FANNER MANUFACTURING CO.

Brookside Park, Cleveland, Ohio • Canadian Fanner, Ltd. Hamilton, Ontario

(*Continued from page* 114)

serted in lead or salt and drawn to the required hardness to about 40 Rockwell C, leaving the tip hard. That method was preferred by Mr. Stagg.

The meeting was adjourned after a rising vote of thanks to Mr. Stagg.—*Henry C. Griggs, secretary.*

New England

ANNUAL meeting of the New England Foundrymen's Association was held at the Hotel Gardner, Boston, Jan. 14. It was the forty-sixth anniversary of the association. About 225 members and guests gathered an hour or so before the dinner to renew acquaintances and enjoy a social chat. After the dinner, which was a special event in itself, the routine reading of the records followed and the election of officers for the coming year took place. The following officers and committee members were chosen:

President, Raymond F. Meader, Whitin Machine Co., Whitinsville, Mass.; vice president, Augustus W. Calder, New England Butt Co., Providence, R. I.; treasurer, Arthur Gibby, East Boston, Mass.; secretary, Ernest F. Stockwell, Barbour-Stockwell Co., Cambridge, Mass. Executive committee, chairman, Augustus W. Calder, New England Butt Co., Providence, R. I.; D. Frank O'Connor, Walworth Co., South Boston, Mass.; T. C. Weiser, Griffin Wheel Co., Chelsea, Mass.; M. A. Hosmer, Hunt-Spiller Mfg. Corp., South Boston; B. W. Hagerman, Rice-Barton Corp., Worcester, Mass.; Charles A. Reed, Roger-Brown-Lavino Co., Cambridge, Mass.

At the executive meeting held prior to the annual meeting, it was decided to postpone the New England regional conference indefinitely.—*M. A. Hosmer.*

N. Ill.-S. Wis.

DUE to inclement weather and the condition of the roads, only 40 were present at the meeting of the Northern Illinois-Southern Wisconsin Chapter which was held Jan. 13 at the Lafayette Hotel, Rockford, Ill. Walter Edens, Ampco Metal Inc., Milwaukee, talked on "Nonferrous Foundry Practice." Those who were present found this discussion to be very interesting and interrupted often with questions. Mr. Edens also showed some colored movies of operations at the Ampco plant.—*J. R. Cochran, technical secretary.*

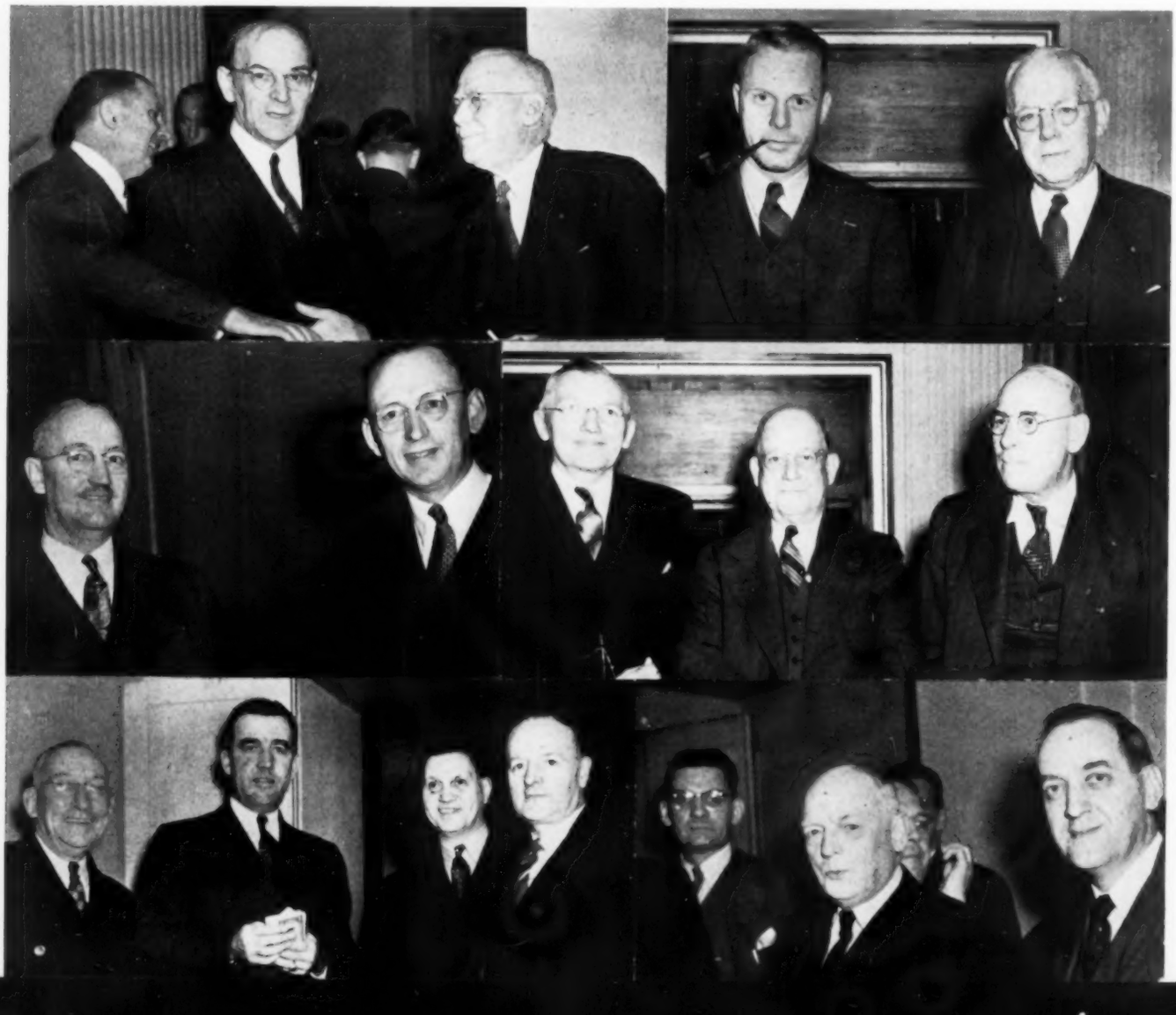
Central Indiana

DISCUSSIONS for both ferrous and nonferrous foundrymen were featured at the Feb. 2 meeting of the Central Indiana Chapter held at the Washington Hotel, Indianapolis. H. B. Harvey, chapter chairman, presided. There were 110 members and guests present. Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, O., discussed "Control Tests for Gray Iron." The discussion included chill tests, temperature measurements, hardness tests, transverse and tensile tests, and limitations as well as applications and uses of the various tests.

The nonferrous meeting was held in another room and E. D. Mooney, Federated Metals Division, American Smelting & Refining Corp., talked on the "Use of Bronze Cast-

(*Continued on page* 119)

New England Foundrymen's Association held its forty-sixth anniversary meeting on Jan. 14 at Hotel Gardner, Boston. Photos courtesy C. A. Wyatt, Debevoise-Anderson Co., Boston



New Pattern Plates

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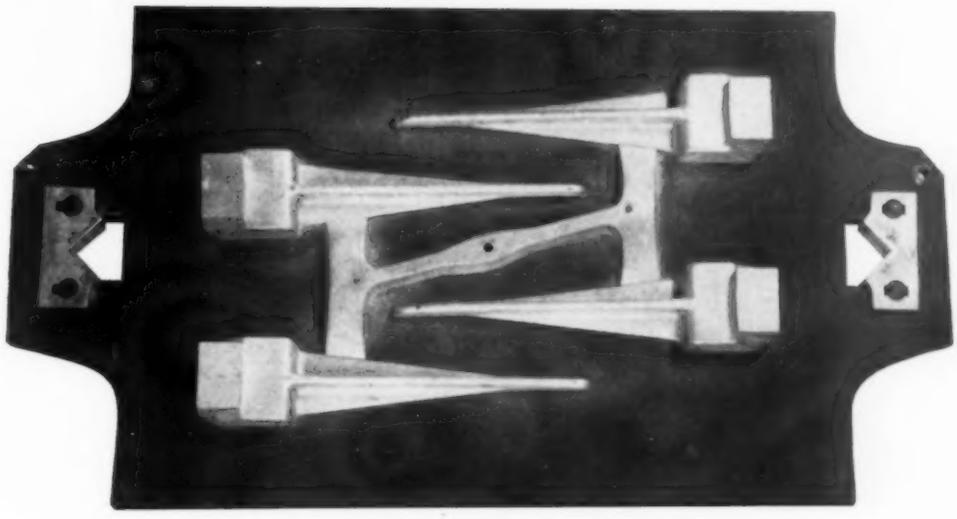

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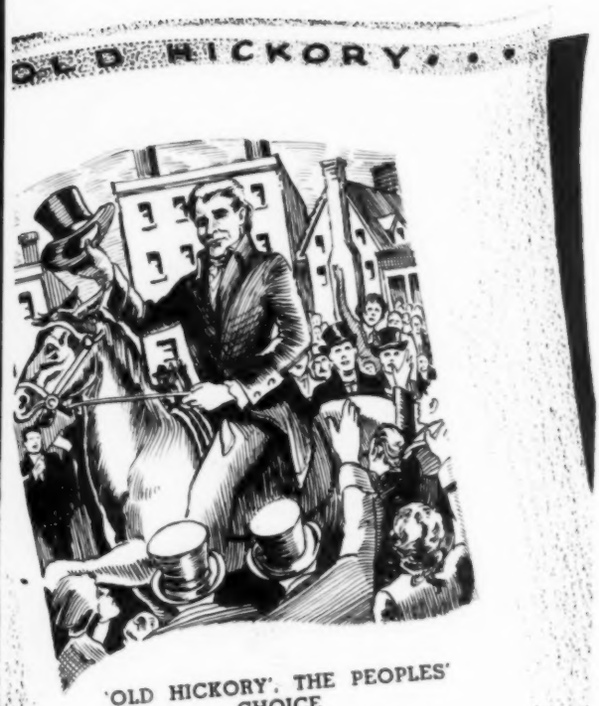
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was used many years for molding pigs made from molten charcoal iron. The product was crude, but a new American industry was on the go. Today JISCO Silvery Pig Iron is ladle mixed and machine cast into small, clean pigs of uniform size. They melt quicker, give better distribution, pile neatly and are easy to handle.

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(*Continued from page* 116)
ings in the Defense Program." His practical experience made his discussion worthwhile to all producers of nonferrous products.

L. P. Robinson, sales manager, Werner G. Smith Co., Cleveland, will be the principal speaker at the March 2 meeting to be held at the Washington Hotel, and his subject will be: "Variables Which Affect the Baking of Cores."—*Ralph A. Thompson, secretary.*

Conn. Nonferrous

NEWLY elected officers of the Connecticut Nonferrous Foundrymen's Association were installed at the Jan. 21 meeting which was held at the Union League Club, New Haven, Conn., with a large attendance present. Ernest F. Stone, the new president, presided over the dinner meeting. The principal speaker, Gregory J. Comstock, professor of powder metallurgy, Stevens Institute of Technology, Hoboken, N. J., discussed "Powder Metallurgy." Professor Comstock explained developments in powder metallurgy and many of its uses with metals and alloys which are impossible to cast or to be made by other processes. Citing that powder metallurgy at present is no direct threat to the casting industry, he pointed out that it should be considered as a process achieving results otherwise impossible.—*Louis G. Tarantino, secretary.*

Western Mich.

ON THE evening of Feb. 2, about 85 foundrymen dined at the Rowe hotel in Grand Rapids, Mich., to participate in the program which was arranged by a group from Grand Rapids with C. P. Ziegler, Grand Rapids Foundry, as program chairman for the meeting. After an excellent dinner, the meeting was opened by the chapter chairman, D. F. Seyferth, West Michigan Steel Foundry Co., who made several important announcements of current interest to foundrymen and then turned the meeting over to Mr. Ziegler, who in turn introduced Roger Allen, a newspaper columnist. Mr. Allen spoke on current world events in a humorous manner and made many forget their troubles, at least for a short while.

Following the coffee talk, Mr. Seyferth introduced the main speaker of the evening, Edwin C. Barringer, executive secretary, Institute of Scrap Iron and Steel, who really gave the foundrymen the low down on the scrap situation today and what to expect in the near future. Among interesting statistics given by Mr. Barringer was the fact that twice as much scrap was used in 1941 as was used in the first year of the World War I and that it amounted to a half billion dollars worth of business. Also, the speaker predicted that we would have complete allocation of scrap which would likely prove a hardship to many. Mentioned was the fact that the scrap industry is one of the few major industries that is not "captive."

Following a lengthy question period, the door prizes consisting of defense savings stamps and donated by Grand Rapids foundries, were presented to the boys with the lucky numbers. With the announcement that the next meeting would be held at the Occidental Hotel, Muskegon, Mich., March 2, the meeting was adjourned.—*Max A. Amos, secretary-treasurer.*

Twin City

JANUARY meeting of the Twin City Chapter was held Jan. 19, in the Coffman Memorial Union, University of Minnesota, Minneapolis. Approximately 100 members and guests gathered for the meeting. A new scheme was tried to promote acquaintanceship by having each member wear a badge showing his name and company.

Immediately following the dinner a short business meeting was held before taking up the regular program. The first was a sound movie "Goose Lake Fire Clay Deposits," which was presented by A. S. Nichols, sales manager, Illinois Clay Products Co., Joliet, Ill. The picture presented in a very interesting manner a history of the deposits and mining, and the preparation of the clays into the various commercial products for use in industry. The second part of the program was given over to Dr. George A. Thiel, geology department, University of Minnesota, who talked on the "Geological History of Molding Sands."—*O. W. Potter, secretary-treasurer.*

New Jersey

CLOSER knit organization of foundrymen to promote the use of castings in war work was urged by Frank G. Steinebach, editor, THE FOUNDRY, Cleveland before the New Jersey Foundrymen's Association at the Downtown Club, Newark, Jan. 26. He emphasized that if the industry as a whole, not just certain divisions, did not make a stronger fight for the war business it is capable of doing, the industry would lose its important position not only for duration of the war but for the period to follow.

John C. Phelan, Benjamin Eastwood Co., Paterson, N. J., president of the association, presided, and announced that John L. Carter, long secretary of the organization, had become affiliated with OPA in Washington.

Stanley G. Oppenheim, WPB, Priority Division, New York, another featured speaker on the program, discussed recent developments in foundry priority procedure and laid no little emphasis on the need for developing a more adequate supply of scrap. He regarded the scrap situation as critical and suggested that the foundry operators, if they believe they are under a disadvantage in competing with steel mills for material under the latest OPA ruling, approach Washington for an adjustment, based on the economic importance of their industry to the war effort.

He spoke of plans for requisitioning scrap, although he did not believe it would be generally necessary, once holders began to realize that the government will take such action if need be. He also spoke of a plan calling for the liquidation of stocks at yards of automobile wreckers with a 30 per cent reduction within 30 days. Mr. Oppenheim discussed various priority rulings, such as PD-3A, PD-25A and others, as they apply particularly to the foundry industry, and directed special attention to P-100 dealing with scarce materials needed for repairs, maintenance and supplies.

Mr. Steinebach predicted that the time was not very far off when foundrymen were not going to be able to obtain pig iron on a B priority. He based this largely on the acute scarcity of scrap which is throwing a constantly increasing burden on pig iron producers and on the belief that the whole program of transition of industry to an all-out war effort is going to be considerably accelerated by the new WPB head, Donald M. Nelson. The speaker could see no real increase in pig iron production for some time to come.

Thus in view of this outlook, it is important for foundries, particularly the gray iron foundries, to go after war work. He stated that foundrymen should make a careful study of war requirements and organize a more comprehensive study of the industry's facilities. He believed that much could be gained by reviewing requirements of machine tool builders, whom he believed would undergo another deluge of war buying. He also suggested the possibility of installing converters where facilities permitted. There are difficulties in the course of such procedure, but he thought they could be licked. He believed it important to use existing facilities to the utmost rather than make it necessary

(*Continued on page* 122)

by cleaning castings *faster,*

America's foundrymen are doing their "best" toward maintaining production of planes, ships, guns, tanks and bombs — just to mention a few of the vital defense needs which the Foundry Industry is producing. Every day production is being stepped up. But yesterday's "best" is not good enough. America's foundrymen must realize that our "best" can never be good enough until victory has been won — that there'll never be sufficient war materials until a just peace has been concluded. It is our duty to contribute more than ever before.

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(*Continued from page* 119)

for the government to stimulate new plant construction.

Mr. Steinebach drew some comparisons between now and the first World War, pointing out that only toward the close of the last conflict did a real appreciation of the foundry industry develop, although its usefulness was fully recognized in Germany and France from the beginning. He indicated that a similar appreciation of all branches of the industry will develop eventually, but emphasized that the industry could do much itself to hasten the day.

Incidentally, he pointed out that during the last war many castings went into shells. However, in the current war the greater use of tanks necessitating armor piercing shells has precluded extensive use of castings for that purpose.—*B. K. Price.*

Metropolitan

SIGNIFICANT developments in the steel foundry industry during recent years was discussed by Henry D. Phillips, plant manager, Lebanon Steel Foundry Co., at the Feb. 2 meeting of the Metropolitan Chapter, held at the Essex House, Newark. K. V. Wheeler, serving as technical chairman, before presenting the speaker cited the rule-of-thumb methods used in the manufacture of steel castings during the last war and pointed out the ever-increasing role steel castings are playing in today's defense production.

Mr. Phillips listed seven factors as contributory to the rapid strides in the improvement of steel castings, and with slides supplementing his talk, he explained each point. Scientific control in steel making, such as the viscosity and density tests now performed on slag, insure a better grade of steel. The new developments and better control have brought acid converter steels back into the picture with properties heretofore unattainable. Room temperature and high temperature tests of cores have shown the advantages of additions, such as basic oxides as secondary binders to prevent high temperature

(*Continued on page* 124)

Approximately 225 members and guests were present at the Jan. 14 meeting of the New England Foundrymen's Association which also was the forty-sixth anniversary of the organization. Photos courtesy C. A. Wyatt, Deboise-Anderson Co., Boston

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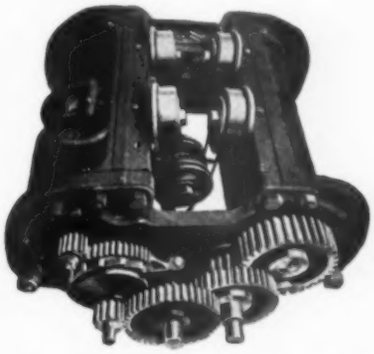

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It Costs Less To Maintain—Sturdy construction . . . seldom, if ever, requires removal from rail . . . covers of controller, motor, drum and gearing are easily removed.

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It's Protected—Controller is fire, dust and moisture proof . . . motor totally enclosed . . . gearing sealed in . . . motor and drum covered by easily removable covers.

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(*Continued from page* 122)
cracking of cores and subsequent veining in the casting.

Directional solidification research, started by Briggs and Gezelius, has probably been the largest contributing factor to sounder castings. The importance of this knowledge in pattern design cannot be overestimated. Radiographic and magnetic inspections aside from being a nondestructive test for the customer, have been an invaluable aid to the foundrymen for studying the effects of different casting procedures. Welding, heat treatment and a scientific production program all contribute to good economical steel castings which today, through the elimination of guess-work and the adaptation of the forementioned developments, are finding ever broadening applications.—*R. E. Ward, assistant chairman, publicity committee.*

An "Information Please" program for the March 2 meeting to be held at the Essex House, Newark, was announced. The "Board of Experts" will cover gray iron, steel, nonferrous, sand, etc. Their names and the master of ceremonies will be announced later. Foundrymen are invited to submit questions on foundry subjects. No one on the board of experts will see the questions in advance, or get any inkling of what they are about. They will have to draw solely on their knowledge and experience. If a question stumps the experts, the sender will get an additional prize.—*B. K. Price.*

N.E. Ohio

ABOUT 170 members and guests with several Navy and Army officers attended the Feb. 12 meeting of the Northeastern Ohio Chapter at Tudor Arms, Cleveland, where Clyde L. Frear, Bureau of Ships, Navy Department, Washington, discussed design and other characteristics of castings for naval vessels. Immediately after dinner Walter L. Seelbach, Forest City Foundries, outlined the aims and objects of a recently formed scrap collection committee and asked for the earnest co-operation of all members in the drive. Following Mr. Frear's presentation an interesting film entitled *The Ninth Inning* based on the life of the late Lou Gehrig was shown through the courtesy of the American Baseball League.

Mr. Frear stated that the main castings in a navy vessel, mostly steel, amount to 3.00 per cent of the total weight. Referring to the rigidity and strictness of navy specifications he pointed out that a naval vessel is a closely integrated unit, built primarily as a combatant, exposed to close, hard service and subject to violent shock and hazard in addition to the usual wind and weather incident to the life of all ocean going craft. Failure of a single casting conceivably might imperil the safety of the ship and the lives of the personnel. Incidentally, he claimed that the navy insistence on absolute perfection has spurred the foundrymen to the production of castings considered in earlier years as outside the scope of practical attainment.

The speaker with blackboard demonstration went into considerable detail on the theory of shrinkage of different metals and spoke highly of the important work on this subject carried on at the Naval Research Laboratory. Radiograph inspection was instituted by the Navy and now is widely used in the foundry industry. Design of the castings always is an important feature, but in certain instances the naval designer has to compromise between theory and practice on account of the fact as a general rule the space available on a vessel is only one-third to one-half of the space available in other installations. Under certain conditions and in view of advancement of welding technique, the speaker favored welded assemblies where a one-piece complicated casting introduced hazard from cracks, shrinkage and porosity. Slides were used to illustrate several types of castings of a complicated character when cast as units, but which were simplified, improved and perfected when separated and cast as two or more parts and then joined by welding. In the present emergency with demand for steel forgings in excess of production capacity, the foundryman has an opportunity to increase the demand for castings.—*Pat Dwyer, vice chairman of publicity committee.*

Western N.Y.

THE Feb. 6 meeting of the Western New York Chapter was well attended in spite of weather and other untoward circumstances, many members apparently being determined to hear L. B. Knight Jr., National Engineering Co., Chicago, discuss "Sand." Mr. Knight handled his wealth of information with such dexterity as to make it seem like a short, short story, highlighted with exceptionally fine slides.

Frank E. Bates, chairman of the committee which conducted the annual stag party which was held Jan. 16, made his report on what the members had already voted unanimously a glowing success. The 299 ticket buyers got their full money's worth—and strange as it may seem—a colored gentleman stole the show with personality and song. Mr. Bates was voted into the Western New York Chapter's hall of fame by acclamation and with his committee given assurance of permanent employment.—*Eliot Armstrong, secretary.*

Ontario

PRACTICAL experience as superintendent of a number of foundries in the United States, combined with a thorough knowledge of sand, enabled Jack Jones of Great Lakes Sand Co., to present an interesting new picture on the importance of sand control to members of the Ontario Chapter at its meeting held in Toronto, Jan. 30.

In introducing his talk, Mr. Jones outlined very briefly the occurrence and preparation for market of a number of important types of foundry sand. He also referred to the relatively complex mixture existing in a foundry sand, upon which sand control procedure must operate satisfactorily. Mr. Jones discussed briefly the principal properties determined in sand control, including moisture, permeability, dry and green strength and grain sizes. The equipment necessary for elementary and for advanced sand control was mentioned and it was shown that improper mounting of equipment, especially the rammer, might make results absolutely worthless.

Dealing not so much with the technique of sand control procedures, as with the application of results in the foundry, Mr. Jones brought out a very interesting point in regard to relationship between permeability and speed of pouring of the metal. In two foundries pouring the same castings, it may be found that one uses sand with a vastly higher permeability than the other, and yet both appear to obtain comparable results. In such a case, the speed of pouring is undoubtedly important, for while permeability governs the speed with which the air in the molds may pass through the sand, it must be remembered that the speed of passage required depends directly upon the speed of pouring the metal.

The importance of sand control is emphasized by war conditions when foundries find themselves in a period of exact testing, with the slightest flaw resulting in the rejection of a casting. In order to meet such specifications, foundries must face the problem of more efficient control of their processes and in this should be included sand control. As an instance, Mr. Jones cited the case of a military casting in which a tiny defect was found on the surface due to steam aris-

(*Continued on page* 126)

THE FOUNDRY CLOCK'S DEMANDS *Are Met By* STERLING WHEELS

TODAY, every clock in every plant is a stern taskmaster. Time is moving swiftly - too swiftly! Foundry wartime production must be speeded up, and then doubled! Unheard-of demands are being made of industry . . materials for victory must roll out of America's industrial plants fast . fast . fast!

Sterling Grinding Wheels in your snagging department will help you turn out work quickly. Foundries in all parts of the country are using them . . finding out the value of having Sterling Wheels built to the particular demand of each grinding problem.

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THE WHEELS OF INDUSTRY

(*Continued from page* 124)

ing from moisture in small globules of clay in the sand. In this job a clay had been used with a very high percentage passing 300-mesh, but it became necessary to utilize an air-floated clay of which 100 per cent would pass 300-mesh.

Unfortunately, the sand problem of the foundry industry varies greatly from shop to shop and while the sand expert can sometimes give valuable assistance, the real solution to most sand problems must be found in the foundry concerned. Eventually all foundries are going to practice sand control and in so doing they will disclose poor practices and increase their efficiency.

Chairman N. B. Clarke, Steel Co. of Canada Ltd., presided at the meeting. Membership committee chairman, Don Barnes, William B. Barnes Co., Hamilton, announced the longest list of new members ever presented at an Ontario Chapter meeting. A draw was held for an attendance prize donated by Dr. Callander of Callander Foundry & Mfg. Co. Ltd., Guelph, Ont.—*G. L. White, secretary-treasurer.*

Chicago

BELIEVING that getting along with your fellow-man is as important in the foundry industry as in other lines of endeavor, the Chicago Chapter took "Human Relations" as the topic for its Jan. 12 meeting, and presented Thomas H. Nelson, executive vice president and dean of the faculty, Dale Carnegie Course Corp., New York, as the speaker. That the subject was popular was proved by the more than 200 attendance.

In introducing his topic, Mr. Nelson emphasized that nothing is more sacred to an individual than his personality and it is frequently said that "an ounce of likable personality is worth more than a ton of algebra." Good human relations are worth more than superior brains or exceptional genius. The speaker said that an individual to be able to get along well with other people must have emotional stability, social adjustability and the will to achieve. He continued by saying that 85 per cent of the factors that contribute to success are not intellectual. Good human relationships magnify the other fellow, rather than one's self.

For those functioning in supervisory capacity, it is well to remember that it is human nature for an individual to want recognition.

When some person has committed an offense or produced bad work, it is also well to consider the following rules in effecting a correction: Let the other fellow save his face; and start with the other fellow's point of view. Two basic questions always can be asked: "How does he get that way?" and "What does he want?" In connection with these questions, it should be borne in mind that all skills can be used rightly or wrongly, and the problem may be one of redirecting the skill. Mr. Nelson said that in any attempt to improve human relations three principles should always be used as a guide: Treat a person as an end, not a means; it is better to change people by helping them, rather than by hurting them; and good human relations sees and deals with each person not as he is but in the light of what he may become. In conclusion, Mr. Nelson pointed out that good human relations makes democracy real.

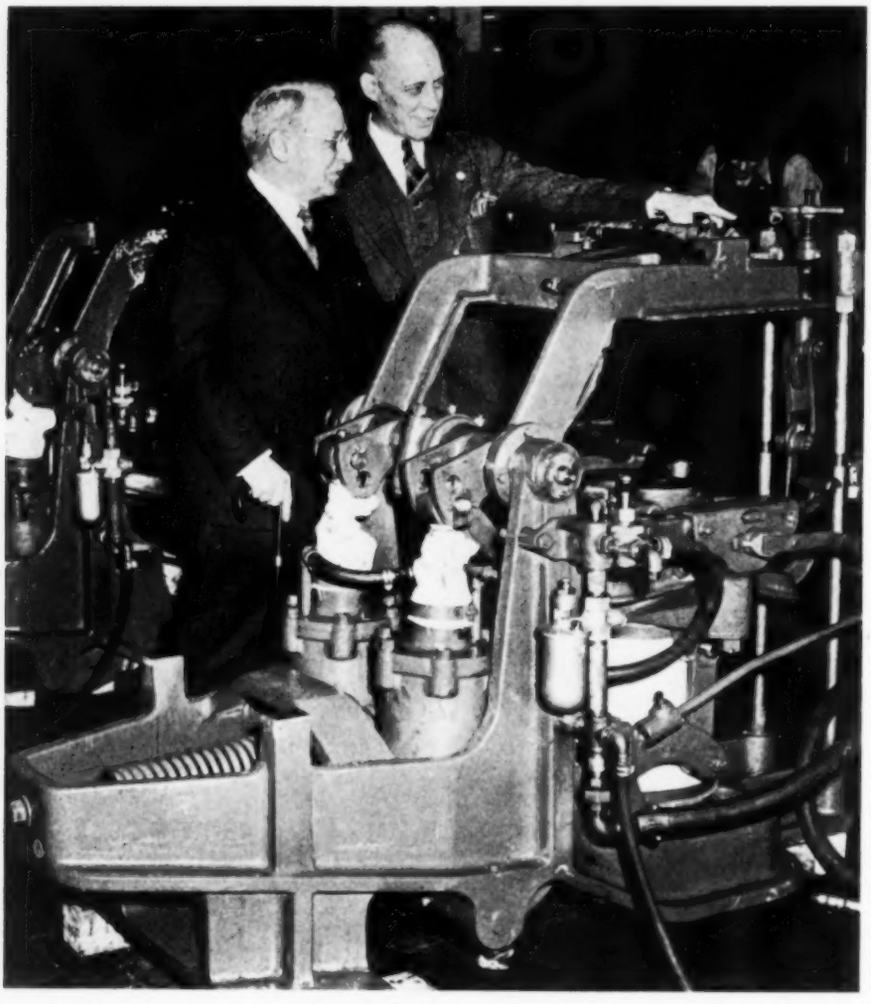
Immediately following dinner, a sound motion picture showed production of fire clays and bonding clays in the Goose Lake, Ill., plant of Illinois Clay Products Co. The picture also covered the manufacture of fire brick and high temperature insulating materials.

Porosity in cast metals was the topic for the regular monthly meeting of the Chicago Chapter, held Feb. 9. Speaker was C. E. Sims, supervisor, division of alloy steel research, Battelle Memorial Institute, Columbus, O. Currently, he and his co-workers have in progress a series of investigations on the much discussed subject of hydrogen in steel.

Mr. Sims maintains that porosity is caused by gas released from the metal, and in discussing "Porosity in Cast Metals," he referred to the fundamentals derived from the research work. Much of his address was devoted to pin holes, a common and aggravating foundry problem awaiting solution. In providing explanations of possible causes and remedies, Mr. Sims dealt with melting, oxidizing and pouring practice, and solidification.

Immediately following dinner, the Chicago representatives of The Linde Air Products Co., New York, presented a film—"Fundamentals of Oxyacetylene Cutting and Welding." This film emphasized safety, conservation of oxygen, and care of

(*Concluded on page* 128)



Franklin G. Smith (left), president of the Osborn Mfg. Co., Cleveland, for 50 years looks over the first molding machine off the production line on the anniversary of his presidency, Feb. 2. R. F. Lincoln (right), sales manager of the firm, points out details of the machine which will be used in the aircraft industry

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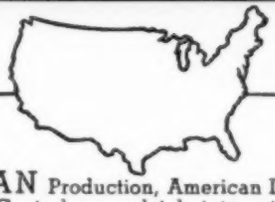

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GRANT BUILDING, PITTSBURGH, PA.

(*Concluded from page* 126)
equipment, matters which are particularly important during the immediate period of scarcity because of the war program. The Linde spokesmen made a plea for prompt return of cylinders for refilling, inasmuch as steel for manufacture of new cylinders is restricted sharply.

In introducing this feature of the program, A. G. Gierach, assistant plant manager, American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., and chapter vice president, stated that the oxyacetylene film had been shown to a selected group of supervisors, foremen and workmen in his plant recently, and as a result of suggestions derived from it, the company set up a gas conservation program which is effecting a saving of $15 per day.

Next meeting of the chapter will be held March 9. E. J. Brady, chief engineer, Western Foundry Co., Chicago, will speak on "Pattern Making Correlated with Foundry Practice." Following this, discussion groups will be held as follows: Gray iron and malleable, chairman, G. B. Stantial, Illinois Malleable Iron Co., Chicago, discussion leader, A. F. Heckendorf, of the same company; steel, chairman, W. H. Parker, American Steel Foundries, East Chicago, Ind., discussion leader, Martin Rinz, Continental Roll & Steel Foundry Co., East Chicago; nonferrous, chairman, Cliff McKelvey, Chicago Hardware Foundry Co., North Chicago, Ill., discussion leader, Fred Riley, Liquid Carbonic Corp., Chicago.—*E. F. Ross.*

St. Louis

MEMBERS of the Steel Founders Society of America from the St. Louis area met with the St. Louis District Chapter of the American Foundrymen's Association at a special dinner meeting Feb. 13 at the DeSoto Hotel, St. Louis. Lloyd C. Farquhar, American Steel Foundries, and representing the Steel Founders society, and Carl Morken, Carondelet Foundry Co., and representing the A.F.A., acted as co-chairmen of the meeting, each making their regular announcements in connection with their groups activities.

Luther Kleber, chairman of the apprentice training committee, St. Louis chapter, A.F.A., described in some detail plans for the pattern making apprentice contest being held as a prelude to the national contest in Cleveland. He urged those who had not as yet indicated their desire to participate should do so in order that the committee's work could be completed. One of the highlights of the evening was the announcement by the chairman of the membership committee, John Williamson, that he held applications for seven new members and they include: Michael B. Shea, Arthur Stephens, Ben Cox, David Callander, all of Fulton Iron Works Co., together with a company membership for that concern; in addition E. D. Temperli, Temperli Pattern Co., and Robert H. Jacoby, Key Co., were welcomed as new members.

Following the business session, Lloyd C. Farquhar introduced the speaker of the evening, A. E. Littleland, St. Louis division, Federal Bureau of Investigation. Mr. Littleland spoke at some length outlining in an interesting and instructive manner the work of the F.B.I. and then offered many suggestions as to plant protection during the war period in this country.—*J. W. Kelin, secretary-treasurer.*

Cancels Conference At Philadelphia

The regional conference committee, with members representing the Metropolitan, Philadelphia and Chesapeake Chapters of the A. F. A., recently met in Philadelphia, and decided to cancel the regional conference originally scheduled for March 28, at the University of Pennsylvania, Philadelphia. Due to the exceptionally heavy operating schedule in the East, it was felt that men responsible for production would not be able to attend the conference. The committee also suggested that if a conference is considered at a later date, the meeting should be held in the fall so as not to conflict with the annual convention of the A. F. A.

The spring conference committee was composed of the following: Harry Reitinger, chairman, Philadelphia Chapter; E. C. Horlebein, and L. H. Denton, Chesapeake Chapter; F. G. Sefing and K. A. DeLonge, Metropolitan Chapter; W. B. Coleman, D. J. Peake, R. S. Munson, J. M. Robb Jr. and B. H. Bartells, Philadelphia Chapter.

Index Is Ready

INDEX of Volume 69 of THE FOUNDRY, covering editorial material published during 1941, now is available. The Readers' Service Department of THE FOUNDRY, Penton Building, Cleveland, will be glad to send the index free to subscribers upon request.

Operated Foundries In Many Countries

Few foundrymen have had the opportunity of operating foundries in as many different parts of the world as has K. J. Zwanziger, formerly of Holland and South Africa and now of the Netherlands East Indies. Incidentally, he is a cousin of Robert Lemans, Tiffany Inc., New York. Mr. Zwanziger was born in Holland, and spent 17 years in patternshops of that country.

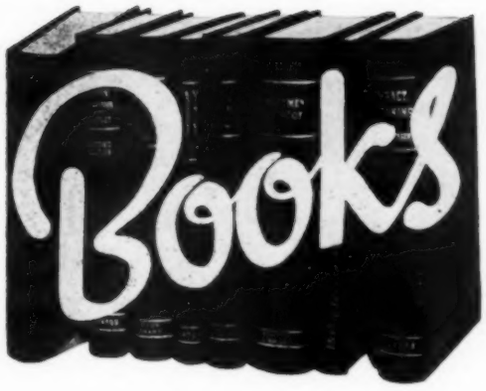
K. J. Zwanziger

For some time he has been located in South Africa and while there was active in the activities of the South African branch of the Institute of British Foundrymen. A paper, which he presented before that branch, entitled, "Pattern Shops in Holland," was published in the January 1941 issue of *The Engineer and Foundryman* of South Africa. Recently Mr. Zwanziger was appointed Technical Officer to the Netherlands East Indies Government at its naval base.

Nominate Officers And Directors

American Foundrymen's Association, Chicago, has announced the following nominations for officers and directors: President, Duncan P. Forbes, president, Gunite Foundries Corp., Rockford, Ill.; vice president, L. C. Wilson, general manager, Reading Steel Casting Division, American Chain & Cable Co. Inc., Reading, Pa.; Directors for 3-year term, J. E. Crown, master mechanic, U. S. Naval Gun Factory, Washington, I. R. Wagner, general manager, Electric Steel Castings Co., Indianapolis, S. V. Wood, president and manager, Minneapolis Electric Steel Castings Co., Minneapolis, and Walton L. Woody, manager, National Malleable & Steel Castings Co., Sharon, Pa.

Election will be announced at the annual convention to be held in Cleveland April 20 to 24.



FOR MODERN FOUNDRYMEN

■ Modern foundry management and practice requires that foundrymen be "on their toes" to meet the demands of industry . . . The PENTON BOOKSHELF of instructive and informative books on all phases of foundry management and practice will help you as it has already helped thousands of other foundrymen. Select those volumes that you need now and order copies today . . . post this advertisement on your bulletin board for the convenience and information of your co-workers. A study of the pages of these books will almost immediately lead to improved efficiency and practice in your shop.

TALES FROM THE GANGWAY

450 pages, 59 chapters, $1 postpaid. This book is a collection of the early chapters of Pat Dwyer's rollicking foundrymen, told in an exceedingly readable style. As practical as it is readable, this book tells the foundryman many practical things, including: the making of gears, open sand plates, sheave wheels, large pots, blast furnace coolers, winding or hoist drums, patterns, stand pipe connections, long columns; core-making, etc. Originally sold for $3, this book is filled from cover to cover with down-to-earth, practical suggestions. If there is a foundryman who does not already have this book he is missing one of the most readable and usable books ever written.

ELEMENTARY FOUNDRY TECHNOLOGY
Revised Third Edition

377 pages, 132 illustrations, 16 tables, $3 postpaid. Revised and with a completely new chapter on malleable cast iron, this long recognized standard book on foundry practice sponsored by the National Founders Association, Chicago, thoroughly covers all phases of foundry practice and procedure. Subjects included: Elements of Iron, Iron Manufacture, The Cupola and Its Operation, Elementary Problems in Steel Foundry Production, Brass Melting, Foundry Sands, Gates and Risers, Molding Machines, Core Machines, Long Life Molds, and Malleable Cast Iron Foundry Practice. This book is ideal for both apprentices and practicing foundrymen.

MODERN BLAST CLEANING AND VENTILATION

213 pages, 38 illustrations, $4 postpaid. This book, by C. A. Reams, engineer of Ford Motor Co., brings latest and most approved methods of casting cleaning to foundrymen in plain language. It is full of completely practical suggestions and proved methods and practices. Application of cleaning methods discussed will eliminate many objectionable cleaning room practices. Full information on abrasive selection and use is included. Practical foundrymen report this book worth many times its cost.

GRAY CAST IRON

383 pages, completely illustrated, $5 postpaid. John W. Bolton, recognized foundry authority has collected and compiled in readable form all recent information on this subject, so presented that it is extremely usable. Includes latest information on structural metallurgy; engineering and physical properties, melting processes; casting defects; effects of regular and alloying elements; superheating; heat treatment; machinability and wear; effect of temperature on mechanical properties; corrosion, and specifications. This book is a "must" in every progressive gray iron foundry.

FOUNDRYMEN'S HANDBOOK

310 pages, fully illustrated, $3 postpaid. This book, reduced from $6 because some specifications are now out of date, has long been a standard reference book among foundrymen. It is a complete compendium and handbook covering every branch of foundry work from estimating the price to cleaning finished castings. If you do not already own a copy of "Foundrymen's Handbook" your working tools are incomplete.

IMPACT CLEANING

480 pages, 256 illustrations, $7 postpaid. Wm. A. Rosenberger is a recognized impact-cleaning engineer who has gathered together all important information on the subject and presented it in readily understood form. Every foundryman knows that cleaning costs can eat up profits. This book shows both theoretical and practical ways to reduce cleaning costs to a minimum. It presents the "how and why" of high cleaning costs and shows exactly the methods to be used in their reduction. No foundryman responsible for either quality production or satisfactory earnings should be without this book.

GATES AND RISERS FOR CASTINGS
New Edition

373 pages, fully illustrated, $3 postpaid. This is a practical book covering completely and with authority a subject never before covered in book form. It is an encyclopedia of sound foundry practice supplying reliable answers to the ever present question, "How can casting defects be prevented?" Written for every foundryman from workman to owner.

For convenience in ordering, use the coupon below . . . be sure to check all the books you want.

AMERICAN MALLEABLE CAST IRON

416 pages, 190 illustrations, formerly $7, NOW $2.50 postpaid. This book by H. A. Schwartz, completely covers history of the industry—its development, modern methods of manufacture, metallurgical principles involved and properties and uses. Also included is a detailed list of all important books and articles on the subject to date of publication. Written primarily for the producer and user of malleable castings, this book is also well adapted to needs of technical students and libraries.

MELTING IRON IN THE CUPOLA

240 pages, 126 illustrations, $2 postpaid. This book formerly sold for $5. Covers practically every phase of cupola construction, operation and maintenance. A thoroughly practical book. Suitable for the novice studying the cupola as well as the practical foundryman who operates it. Tables, formulas and a complete cross-index listing more than one thousand items makes this a valuable reference and practical work book.

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- ☐ **"Gates and Risers for Castings," @ $3 postpaid**
- ☐ **"Gray Cast Iron," @ $5 postpaid**
- ☐ **"Modern Blast Cleaning and Ventilation," @ $4 postpaid**
- ☐ **"Impact Cleaning," @ $7 postpaid**
- ☐ **"Foundrymen's Handbook," @ $3 postpaid**
- ☐ **"Melting Iron in the Cupola," @ $2 postpaid**
- ☐ **"American Malleable Cast Iron," @ $2.50 postpaid**
- ☐ **"Tales from the Gangway," @ $1 postpaid**

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FOUNDRY ACTIVITIES

POWER IRON WORKS, Pueblo, Colo. has been purchased by the E. F. G. Engineering Works and is being rehabilitated. Kenneth M. Ohlander, formerly of Denver, is business manager of the firm. A foundry, steel drop forging and pattern departments will be established in the new plant. The firm plans to produce about 20 tons of iron, brass, bronze, aluminum and alloy castings daily.

* * *

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., is considering the construction of a plant and office addition.

* * *

Canadian Ingersoll-Rand Co. Ltd., Sherbrooke, Que., is preparing plans for a further addition to its foundry and shop No. 2.

* * *

Building permit has been issued to Paul T. Welles for construction of a foundry at 909 North Lake street, Burbank, Calif.

* * *

Ford Motor Co., Dearborn, Mich., has awarded general contract for construction of a steel foundry to Bryant & Detwiler Co., Detroit.

* * *

Barnes Mfg. Co., 651 North Main street, Mansfield, O., has various improvements under way at its factory and office.

* * *

Empire Brass Mfg. Co. Ltd., London, Ont., is considering plans for erection of a plant addition.

* * *

Precision Dies & Castings Ltd., 282 St. Helens avenue, Toronto, Ont., has let contract to Frankel Bros. for a plant addition.

* * *

International Harvester Co. of Canada Ltd., Sherman avenue North, Hamilton, Ont., is erecting a plant addition.

* * *

Western Stove Co., Culver City, Calif., is erecting a plant on a 300-acre site near San Bernardino, Calif.

* * *

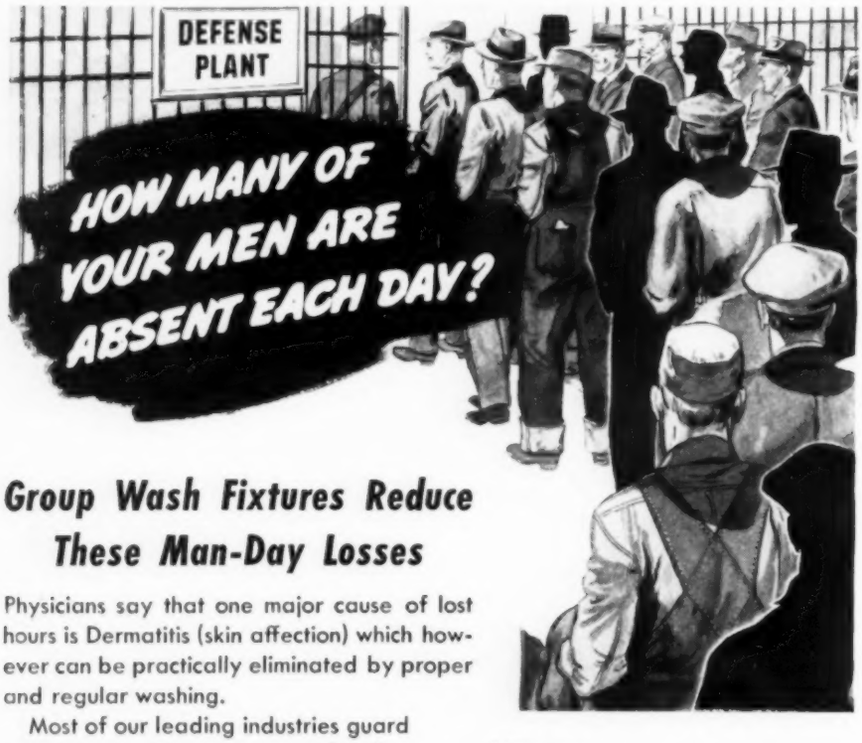
Rogers Pattern & Foundry Co., 938 East Sixtieth street, Los Angeles, is building an addition to its plant.

* * *

Marion Steam Shovel Co., Marion, O., has plans for construction of an addition to its foundry, making possible a 30 per cent increase in production.

* * *

Reliable Aluminum Ware Co. Inc., Los Angeles, I. J. Weinman, secretary, has obtained a certificate to conduct business under the name of



Group Wash Fixtures Reduce These Man-Day Losses

Physicians say that one major cause of lost hours is Dermatitis (skin affection) which however can be practically eliminated by proper and regular washing.

Most of our leading industries guard employee health with sanitary Bradley "Multiple-person" Washfountains. Bradleys serve 8 to 10 persons simultaneously—supplying each with clean, sanitary running water from a central sprayhead.

Bradleys save time and space, and reduce water consumption . . . They cut installation costs, too, because an 8 to 10-person Washfountain requires but one set of piping connections, 1/8 to 1/10th as many as required for 8 to 10 "single person" wash basins.

"Washroom Plan Book" will be mailed on request. BRADLEY WASHFOUNTAIN CO., 2217 West Michigan Street, Milwaukee, Wisconsin.

The sprayhead serves clean running water to each person—the bowl is self-flushing to prevent collection of water and contamination.

BRADLEY washfountains

Los Angeles Magnesium Casting Co. as 5531 South Riverside drive, Los Angeles.

* * *

Arrangements have been made whereby the former plant of the Stover Mfg. & Engine Co., Freeport, Ill., will be rented to Fairbanks, Morse & Co., Chicago.

* * *

American Foundry Co., 2944 First avenue South, Seattle, recently was damaged by fire. Contract for rebuilding has been awarded to Henrik Vallee.

* * *

New Standard Foundry Co., Jarvis street, Toronto, Ont., plans to rebuild foundry and install equipment. Estimated cost approximately $25,000.

* * *

Cadillac Motor Division, General Motors Corp., Detroit, has awarded general contract to A. Albrecht Co., Detroit, for alterations to its foundry.

* * *

General Steel Castings Corp., Granite City, Ill., plans erection of a steel foundry for which it has awarded general contract to Frazier-Davis Construction Co., St. Louis. Estimated cost is $150,000.

* * *

American Hammered Piston Ring Division, Koppers Co., Bush and Hamburg streets, Baltimore, is reported planning construction of a steel foundry to cost about $40,000.

* * *

American Steel Foundries, East Chicago, Ind., has started construction of a new foundry which will turn out 4400 tons of finished product a month. The plant will cost $16,500,000.

* * *

Cooper-Bessemer Corp., Mt. Vernon, O., will erect additions to storage facilities at its Grove City, Pa., plant. Contracts have been let for a finished material storage building, and a pattern storage building.

* * *

Zelis & Howell Foundry is the firm name under which Christopher L. Zelis and Harry D. Howell Jr. have obtained a certificate to conduct business at 651 Compton avenue, Los Angeles.

* * *

Ohio Steel Foundry Co., Lima, O., plans to construct a foundry unit including a foundry building, electric melting furnace, heat treatment furnaces and machine tool equipment.

* * *

Crane Co., Chicago, is undertaking a $6,000,000 expansion program to increase its capacity, according to John H. Collier. When completed, the expansion, which includes

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C-66

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two buildings, will enable the company to almost double its present production of cast steel valves. Preliminary work on the expansion already has started.

* * *

Hull Iron & Steel Foundries Ltd., Montcolm street, Hull, Que., has started work on erection of plant addition, building to cost about $350,000 and equipment $600,000. General contract has been let to R. Brunet & Fils, 35 Aylmer road, Hull.

* * *

Doehler Die Casting Co., Toledo, O., has been awarded the Navy "E" pennant and the Bureau of Ordnance flag, the highest service awards the Navy can make. The ceremony was held in the Civic auditorium, Sunday, Feb. 15, with the awards being made by Capt. E. A. Lofquist, chief of staff of the Ninth Naval district.

* * *

Flour City Ornamental Iron Co., Minneapolis, was presented a Bureau Ordnance flag and Navy "E" pennant for excellence in production of naval ordnance materials. The presentation was made by Admiral John Downes, commandant of the Ninth Naval District. Walter B. Tetzlaff, president of the company, accepted the awards for the management, and Wallace Schorr, production manager, and Richard A. Scherer, oldest employe from the standpoint of service, for employes.

* * *

Granite City plant of the American Steel Foundries was honored by the Navy for its outstanding work in the production of Navy materials. The presentation of the Navy flag and the "E" pennant was made in the company's new casting plant and included presentation of "E" buttons to each of the concern's 2100 employes. Thomas D. Drever, president and Alfred Walcher, vice president of the company, and high officials of the Army and Navy were present for the ceremony.

* * *

Permold Co., Medina, O., was awarded the Bureau of Ordnance flag and the Navy "E" pennant at a colorful ceremony in Medina High School auditorium Jan. 24, for outstanding performance in the production of ordnance material. The company is one of the large producers of permanent mold aluminum alloys castings. The awards were presented by Capt. E. A. Loftquist, U. S. N., chief of staff, Ninth Naval District, Great Lakes, Ill. E. G. Fahlman, president of the Permold Co. accepted the awards on behalf of the company and its employes. Each employe of the company was presented with an "E" pin.

Obituary

WILLIAM J. CORBETT, vice president and works manager, Atlas Steel Casting Co., Buffalo, died Feb. 3. Mr. Corbett for many years had been active in various group activities of the foundry industry, including the American Foundrymen's Association of which he was a director and the Steel Founders' Society of America. He was born in Kingston, Ont. and attended school at Central High School, Erie, Pa. He was

William J. Corbett

graduated from Carnegie Institute of Technology, Pittsburgh, in 1914 with a bachelor of science degree in mining engineering and in 1922 obtained a professional degree in metallurgical engineering. After graduation he was employed by the American Steel Foundries, Alliance, O., as a special apprentice. In 1915 he was transferred to the Chester plant as a production engineer. Four years later he was sent to the Chicago office to become an assistant to the vice president. Mr. Corbett resigned in 1921 to become cost accountant with the Steel Founders' Society of America, but left that position a year later to return to Chicago as an industrial engineer for the Electric Steel Founders' Research Group. In 1925 he returned to the Steel Founders' Society of American as secretary and manager and remained with that organization until 1929 when he became assistant to the president and works manager of the Fort Pitt Steel Casting Co., McKeesport, Pa. He became vice president and works manager of the Atlas Steel Casting Co. in 1933. Mr. Corbett was a past chairman of the Western New York Chapter of the A. F. A. and wrote extensively for the technical press and for various engineering organizations.

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Standard CONVEYORS

William A. Griffin, 59, president, Standard Buffalo Foundry, Buffalo, died Jan. 31 in Miami, Fla.

* * *

William M. Scudder, 65, retired vice president American Radiator Co., Chicago, division of American Radiator & Standard Sanitary Corp., died Jan. 21 in Rochester, Minn.

* * *

Axel N. Lindberg, 66, president, Lindberg Engineering Co., and Lindberg Steel Treating Co., Chicago, died at his home in Evanston, Ill., Feb. 2. Mr. Lindberg was a native of Sweden and he came to the United States as a young man. In 1920 he organized the Lindberg Steel Treating Co. and the Lindberg Engineering Co. in 1935. Mr. Lindberg was a past president of the Metal Treating Institute, and a memebr of the American Society for Metals.

* * *

Thomas J. Connor, 48, vice president and a director, Caterpillar Tractor Co., Peoria, Ill., Jan. 23 at his home in that city after a heart attack.

* * *

George E. Howard, 84, retired vice president and sales manager, Commonwealth Steel Corp., now the General Steel Castings Corp., Granite City, Ill., died recently at his home in St. Louis.

* * *

Frederic B. Jacobs, noted authority on the grinding industry and former editor of *Abrasive Industry* formerly published by the Penton Publishing Co., died at his home in Cleveland Jan. 20, after a long illness. Mr. Jacobs was born in South Hingham, Mass., Jan. 5, 1880, of an old New England family. Leaving school at Quincy, Mass., at an early age he learned the machinist trade, becoming skilled as a machinist and toolmaker. In December, 1908, he entered the employ of the Carborundum Co., Niagara Falls, N. Y., as a sales engineer, five years later joining the Abrasive Co. in a like capacity. In 1916 he became a tool designer with Nordyke & Marmon Co., Indianapolis, then assistant chief tool designer, working on

Frederic B. Jacobs

tools that built the Liberty motors for the company in World War I.

He joined the Penton Publishing Co. in 1917 on the engineering staffs of *Marine Review* and *Iron Trade Review*, now *Steel*, being named editor of *Abrasive Industry* in 1920 and holding that position until 1932. He was with the Cleveland Container Co. as advertising and sales manager in 1933, and in 1935 was employed as a machinist by National Acme Co. In May 1936, he rejoined the Penton company in the editorial department of *Abrasive Industry*, which was changed to *Abrasives* in 1937. He had patented a number of engineering devices and was the author of five books on the art of grinding and since 1910 he had contributed to trade and technical magazines.

* * *

Hays H. Clemens, 58, president, Erie City Iron Works, Erie, Pa., and treasurer, Hayes Mfg. Co., Paterson,

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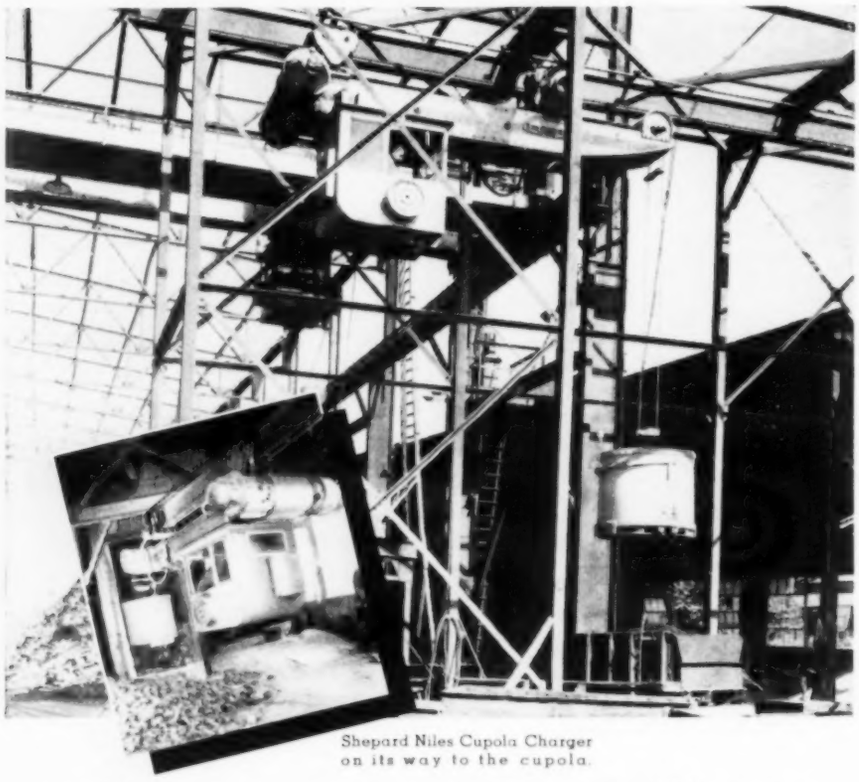

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N. J., died Jan. 27 while visiting in Dallas, Tex. Mr. Clemens was a member of the board, American Cyanamid Co., and was president, American Engine and Boiler Manufacturers' Association.

* * *

James A. Thomson, 61, president of Gartshore-Thomson Pipe & Foundry Co. Ltd., Hamilton, Ont., died at his home in that city Jan. 14. Mr. Thomson was born in Hamilton and was a graduate of McGill University.

* * *

Ezra Frick, 86, for 18 years president, Frick Co., Waynesboro, Pa., died Feb. 2, at his home. Mr. Frick was president, American Society of Refrigerating Enginers in 1918 and was a founder of the Ice Machinery Builders' Association.

* * *

Bert C. MacLeod, 61, who retired a year ago as employment manager, McCormick works, International Harvester Co., Chicago, died Jan. 25 at his home in Oak Park, Ill. He had been with the company 40 years.

* * *

Van B. Hunter, 51, safety supervisor, International Harvester Co., Chicago, died in Moline, Ill., hospital Jan. 23, following a stroke suffered the previous day while he was attending an organization dinner. He had been associated with the Harvester company 34 years.

* * *

Solomon Barnes, 75, for 17 years superintendent of the Medina Iron & Brass Co., Medina, N. Y., died at his home in that city Jan. 8. Mr. Barnes was first associated with the A. L. Swett Iron Works, Medina, approximately 54 years ago. He then went to Montreal, Canada where he was associated with a foundry and later he became one of the partners in a foundry at Three Rivers, Que. He left there immediately after the World War.

* * *

Charles J. Brittain, 64, president and chairman of the board, Canadian Fairbanks-Morse Co. Ltd., Montreal, died in that city Jan. 11. Mr. Brittain, who had been with the firm for 40 years, had been president since 1936. His first position was as cashier, purchasing agent and salesman for the James Morrison Brass Mfg. Co. Ltd., from 1893 to 1901. He became manager of the Toronto branch of Fairbanks in 1902 and was appointed a director in 1918.

Wellman Engineering Co., Cleveland, has moved its Chicago office to room 1112 Merchandise Mart, 222 West, North Bank drive. John E. Carlson, Williams Bucket Division of Wellman Engineering Co. is in charge of clamshell and dragline bucket sales and service of the branch.

Book Review

Short Term Training in The Foundry, prepared by the National Founders Association, 120 South La Salle Street, Chicago; fabricoid cover; ring binder; loose leaf; 120 pages 8½ x 10½ inches.

The primary purpose is to meet the need for more workmen in the foundry. Difference in products and methods make each foundry an individual workshop and a competent supervisor is vitally essential to the success of any training course. The course is not intended as a substitute for a regular apprenticeship necessary in training a first class journeyman molder.

The present manual was prepared with a view of telling a learner the how and why in such a manner that he will be able to do a job with a minimum of teaching and direction. Following 4 illustrated pages on specific safety features, 21 chapter or lessons cover: Sands, trade terms, patterns, types of molding, gating, bench molding, floor molding, molding machines all types, metal pouring, flasks, bench coremaking, floor coremaking, melting, cleaning, casting defects causes and remedies.

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● Truscon Foundry Flasks are designed and built to meet the particular requirements of all types of foundries. Light weight . . . durability . . . strength where strength is needed . . . easily rammed and shaken out . . . these are famous Truscon features.

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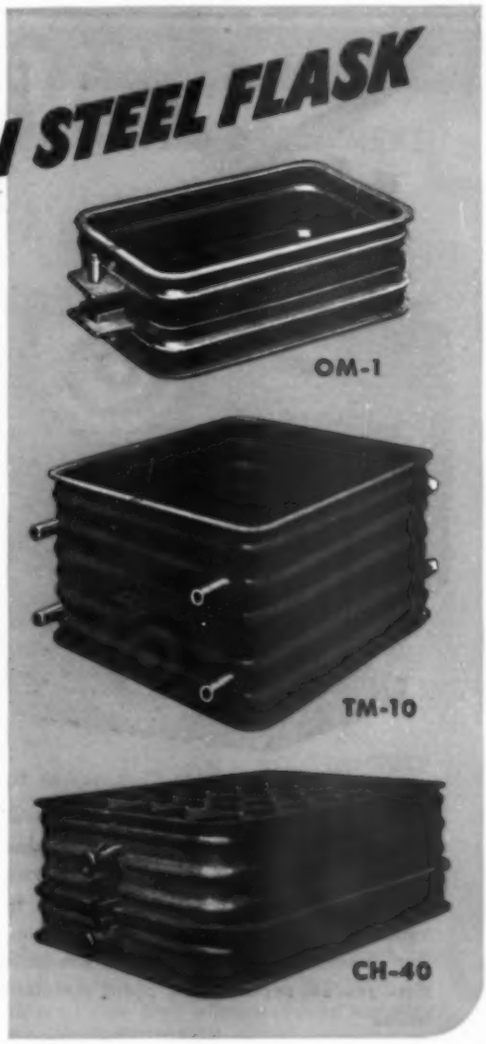

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TRUSCON FOUNDRY FLASKS

CONVENTION TO FURTHER WAR EFFORT

(*Continued from page* 63)

formation and gain from experience of others information to aid in solving their castings problems.

Arrangements have been made for a special meeting each day of the convention for the presentation of talks by Army, Navy or government officials who will present their views as to the part the castings industry can and should play.

For the first evening of the convention, plans have been made for a reception of guests from Central and South American countries. Following the reception there will be one session for presentation of papers from those countries. The author of one of these papers will be Miguel Siegel, Instituto De Pesquisas Tecnologicas, Sao Paulo, Brazil, who will discuss the foundry industry of Brazil. The other paper will be presented by H. H. Miller of the Fundicion De Bronce Miller, Torreon, Coah, Mexico, who will discuss nonferrous foundry problems encountered in Mexico.

Foremost among problems encountered by some of the foundries enlarging their staffs is that of training workers to fill responsible positions. The apprentice training committee of the association will present at its meetings W. F. Patterson, Chief, Federal Committee on Apprenticeship, and Donald F. Lane, Director of Training, Bethlehem Steel Co., Sparrows Point, Md., who will present information on how specialized training problems are being met.

Foreman training will be discussed at a round table meeting arranged by an A.F.A. committee under the chairmanship of W. E. George, Campbell Wyant & Cannon Foundry Co. Training in engineering schools is to be emphasized by the A.F.A. committee report summarizing a survey of foundry training prepared by the committee on co-operation with engineering schools under the direction of Fred Sefing, International Nickel Co., New York. Dean C. J. Freund, College of Engineering, University of Detroit, Detroit, will also discuss this general subject.

Discuss Plant Protection

One of the most timely reports to be presented will be that of the committee on recommendations for plant defense and protection. This committee which has been working under the chairmanship of James R. Allan, International Harvester Co., Chicago, will have for discussion an extensive report on recommendations which it has been developing in co-operation with the Federal agency on plant defense.

An instructive series of lectures is that to be given by H. W. Dietert, Harry W. Dietert Co., Detroit, who in four sessions will discuss theory and practice of core production. This will be a completion of a series started at the 1941 convention and it is expected that the material will be available at this year's meeting in the form of a book.

Recognizing the value of data obtained through job evaluation and time studies, E. L. Berry, Link Belt Co., Chicago, will present information on methods developed in his plant. This meeting is being sponsored by a committee under the chairmanship of Frank Wartgow, American Steel Foundries, East Chicago, Ind.

Four sessions are to be devoted to presenting information on fundamentals of sand shop control. These sessions will be led by W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

Continuing its activities in sand research work, the A.F.A. commit-

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tee has arranged for the presentation of papers by several outstanding authorities. These will be "Dry Sand Molding Procedure for Heavy Castings," by W. A. Hambley and A. Lebesh, Allis-Chalmers Mfg. Co.; "Causes of Drying Out of Synthetic Sands," by N. J. Dunbeck, Eastern Clay Products, Inc.; "Sea Coal in Foundry Sands," by E. C. Zirzow, National Malleable & Steel Castings Co.; "Resin Binders in Molding Sand," by E. Pragoff, Hercules Powder Co.; "Flowability of Molding Sands in Terms of Work," by E. O. Lissell, University of Michigan; "Investigation of Durability of Foundry Sands," by J. CoVan and C. E. Schubert, University of Illinois.

The committee on foundry costs, under the chairmanship of R. L. Lee, Liberty Foundry division, Grede Foundries, Inc., is organizing a round table discussion of cost methods demanded by conditions confronting the industry at the present time.

Two Patternmaking Sessions

This year the patternmaking division of the association has arranged for two sessions, with the following papers and reports: "Design of Core Boxes and Driers for Core Blowing," by O. A. VanSickle, City Pattern Works; "Equipment for Blowing Cores," by R. F. Lincoln, Osborn Mfg. Co.; "Production of Copper Castings," by A. K. Laukel, Electro-Chemical Pattern & Mfg. Co.; "Specifications for Foundry and Pattern Lumber," by E. T. Kindt, Kindt-Collins Co.; "Driers and Green Topping Cores," by George Gedeon, Aluminum Co. of America, and Frank C. Cech, Cleveland Trade School. Two reports will be included in this program, one on "Plastic Coatings for Core Boxes and Patterns," and one on "Rubber Coatings for Core Boxes."

A plant and plant equipment session has been arranged by a committee under the chairmanship of James Thomson, Continental Roll & Steel Foundry Co. In addition to a paper on "Casting Cleaning in a Gray Iron Production Foundry," by H. B. Nye, New York Air Brake Co., this session will feature a discussion of priorities relating to purchase of foundry equipment.

The Steel division is scheduling four sessions, one of these being a round table discussion under the chairmanship of R. S. Munson, Atlantic Steel Casting Co. The papers scheduled before other sessions are "Steel Pouring Refractories," by R. H. Stone, Vesuvius Crucible Co.; "Use of Iron Oxide in Cores for Steel Castings," by F. B. Riggan, Key Co.; "Economics of Grinding Steel Castings," by J. A. Westover, Dyer Engineers, Inc.; "Atmospheric Pressure in Steel Casting—A New Technique of Gating and Risering," by H. F. Taylor and E. A. Rominski, Naval Research Laboratory.

"Studies of Centerline Shrinkage," by J. A. Duma and S. W. Brinson, Norfolk Navy Yard; "Open Hearth Practices," by C. W. Briggs, Steel Founders' Society of America; "Making Navy Steel in Basic Electric Furnaces," by S. W. Brinson and F. B. Anderson, Norfolk Navy Yard; "Production of Uniform Steel for a Light Castings Foundry," by C. H. Kain and L. W. Sanders, Lake & Elliott, Braintree, Essex, England (I.B.F. Exchange Paper); "Properties of Low Alloy Copper Cast Steels," by H. F. Taylor, H. F. Bishop and E. A. Rominski, Naval Research Laboratory; "Welding of Medium Carbon Steel Castings by Metal Arc Process," by S. E. Mueller, A. B. Smith and J. F. Oesterle, University of Wisconsin; reports of committees on developments in magnetic powder test, radiography, and methods of producing steel for castings.

Many interesting papers will be presented under the direction of the gray iron division. Four gray iron shop course sessions, arranged by the shop course committee under the chairmanship of K. N. Priest-

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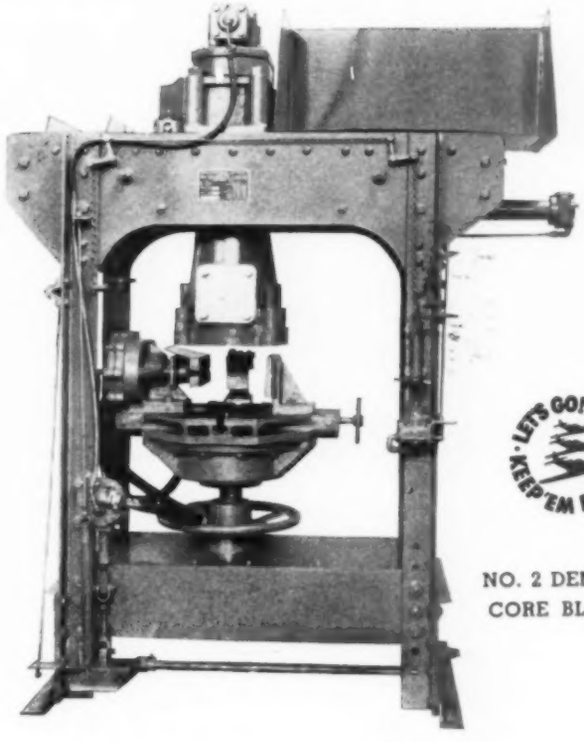

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CORE BLOWERS *Exclusively*

ley, Eaton-Erb Co., will specialize in discussion of shrinkage. Various phases of this subject will be discussed each day. The technical papers scheduled are "Melting Practices," by Dr. A. E. Schuh, U. S. Pipe & Foundry Co.; "Cupola Control," by Fulton Holtby and H. F. Scobie, University of Minnesota; "Gates and Risers," by W. W. Levi, Lynchburg Foundry Co.; "Oxidation Resistance of Ordinary and Graphitized Cast Iron," by C. O. Burgess, Union Carbide and Carbon Research Laboratories; "Cast Iron—Strength vs. Structure," by R. R. Adams, Battelle Memorial Institute; "Metallurgical Study of Cast Iron for Glass Forming Molds," by W. H. Bruckner, and H. Czyzewski, University of Illinois.

"Production Hardening of Close Grain Cast Iron," by D. V. Ludwig, Capitol Foundry Corp.; "Effects of Alloys on Transformation," by R. G. McElwee, Vanadium Corp. of America; "Inoculation Effects upon Austenitic Cast Iron," by J. T. Easch, International Nickel Co.; "Elastic Properties of Some Alloy Cast Iron," by A. I. Krynitsky and C. M. Saeger Jr., National Bureau of Standards; "Effects of Phosphorus on Growth of Cast Iron," by Morris Cohen, Dept. of Metallurgy, Massachusetts Institute of Technology.

The malleable division is represented on the program with three meetings. Two of these will be given over to the presentation of a symposium on graphitization. Those appearing on this graphitization symposium, with their topics are: "Principles of Graphitization," by Dr. H. A. Schwartz, National Malleable & Steel Casting Co.; "The Suppression of Primary Graphite," by Dr. Richard Schneidewind, University of Michigan; "Some Effects of Hydrogen on the Time of Malleabilization," by C. H. Lorig and M. L. Samuels, Battelle Memorial Institute; "Temperature Control of Graphitizing Furnaces," by J. H. Lansing, Malleable Founders' Society.

"Atmosphere Control in Annealing Furnaces," by R. J. Cowan, Surface Combustion Corp.; "Intermittent Annealing Furnaces," by W. R. Bean and W. R. Jaeschke, Whiting Corp.; "Electric Furnace Annealing," by R. M. Cherry, General Electric Co.; "Tunnel - Kiln Annealing," by R. J. Anderson, Belle City Malleable Iron Co.; "The Promotion of Annealing Rate by the Selection of Chemical Composition," by W. D. McMillan, International Harvester Co.; "Arrested Anneal Malleables," by D. P. Forbes, Gunite Foundries Corp. At the third session of the malleable division, Fred Reeves, the Saginaw Malleable Iron division, General Motors Corp., will have a discussion of "Malleable Iron Gating and Risering," with D. F. Sawtelle, Malleable Iron Fittings Co., presenting a paper on "Sand Control in a Mechanized Malleable Foundry."

Nonferrous Division Program

The nonferrous division will have an unusually heavy program, with a round table meeting, its annual social dinner and two technical sessions. The round table meeting discussion will deal with causes of porosity with J. E. Crown, Washington Navy Yard leading a discussion on "Causes of Porosity in Silicon-Bronze Castings," and W. B. George, R. Lavin & Sons, leading the discussion on "Some Causes of Porosity in Navy 'G' and 'M' Metals." Papers for the two technical sessions will be as follows:

"The Place of Nonferrous Castings in Aircraft," by N. E. Woldman, Eclipse Aviation Div., Bendix Aviation Corp.; "Plaster Molds for Precision Nonferrous Castings," by Henry Hagemeyer, Castings Patent Corp.; "Effects of Furnace Atmospheres on Heat Treating of Magnesium and Aluminum Alloys," by D. V. Ludwig, Capitol Foundry Corp., and Wayne Martin, Sperry Gyro-

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scope Co.; "Salvage of Aluminum Alloys by Welding," by A. T. Ruppe, Bendix Products Div., Bendix Aviation Corp.

The cupola research committee under the chairmanship of D. J. Reese, International Nickel Co., is planning to have several reports for presentation and discussion. These reports are being prepared by subcommittees of the project and will deal with and present material which is being prepared for later inclusion in the cupola operation handbook. The reports presented at this meeting will be subject to later revision before publication.

Monday, April 20

9:00 a.m.—Registration
11:00 a.m.—Opening Meeting
2:30 p.m.—(a) Nonferrous Session
(b) Malleable Session
4:30 p.m.—Core Practice Lecture Course
6:00 p.m.—Reception for Guests from Central and South American Countries (This reception will be followed by a session at which papers from Central and South American countries will be presented)
8:00 p.m.—Patternmaking Session

Tuesday, April 21

9:00 a.m.—(a) Sand Shop Course
(b) Gray Iron Shop Course
10:00 a.m.—(a) Malleable Symposium—Section 1
(b) Nonferrous Session
(c) Apprentice Training Session
11:45 a.m.—Special Session on War Production Problems
12:30 p.m.—(a) Nonferrous Round Table Luncheon
12:30 p.m.—(b) Malleable Round Table Luncheon
2:30 p.m.—(a) Malleable Symposium—Section 2
(b) Patternmaking Session
(c) Foreman Training
4:30 p.m.—Core Practice Lecture Course
6:30 p.m.—Apprentice Instructor's Dinner
6:30 p.m.—Nonferrous Division Dinner
8:00 p.m.—Refractories Session

Wednesday, April 22

9:00 a.m.—(a) Sand Shop Course
(b) Gray Iron Shop Course
10:00 a.m.—Business Meeting and Awards Lecture
2:30 p.m.—(a) Plant Defense and Protection Session
(b) Gray Iron Session
(c) Steel Session
4:30 p.m.—Core Practice Lecture Course
6:30 p.m.—(a) Chapter Officers' Dinner
(b) Foundry Instructors' Dinner
8:00 p.m.—(a) Engineering School Instruction in Foundry Practice
(b) Job Evaluation and Time Study Session

Thursday, April 23

9:00 a.m.—(a) Gray Iron Shop Course
(b) Sand Shop Course
10:00 a.m.—(a) Sand Research Session
(b) Foundry Costs and Merchandising Castings
11:45 a.m.—Special Session on War Production Problems
12:30 p.m.—Steel Division Round Table Luncheon
2:30 p.m.—(a) Gray Iron Session
(b) Plant and Plant Equipment
(c) Sand Research
4:30 p.m.—Core Practice Lecture Course
7:00 p.m.—Annual Dinner

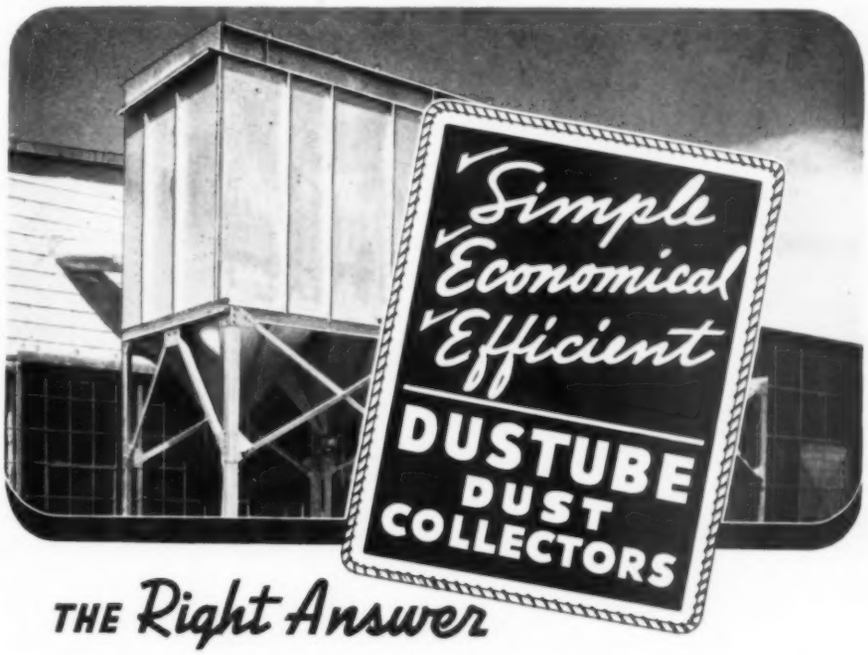
Friday, April 24

9:00 a.m.—(a) Sand Shop Course
(b) Gray Iron Shop Course
10:00 a.m.—(a) Steel Session
(b) Gray Iron Session
(c) Sand Research Session
11:45 a.m.—Special Session on War Production Problems
2:30 p.m.—(a) Steel Session
(b) Gray Iron Session
4:30 p.m.—Core Practice Lecture Course

Reviews Subcontracts

Policyholders Service Bureau of the Metropolitan Life Insurance Co., 1 Madison avenue, New York, recently has issued a booklet "Subcontracting for Defense," which is a report of methods followed by 28 companies who have been especially successful in meeting the problems of prime contracting or subcontracting. The booklet includes a section on obtaining prime contracts for various types of supplies and equipment required by the government, describes the sources of information on governmental requirements and on procurement setup and procedure.

The report also discusses the administration of and responsibility for subcontracting in the prime contractor's organization, and the steps commonly followed in selecting and scheduling work to be farmed out to subcontractors.



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COLLECTING PATTERN SHOP COST DATA

(*Continued from page* 69)

burden, plus *its* profit.

Burden (often termed overhead expense) comprises all costs that can not be practically charged to individual jobs. That is shown in the upper section of "Pattern Shop Cost" on accompanying chart. The determination of pattern shop burden is based upon analysis of the various expenses incident to the operation of the department, and are thus explained:

Depreciation is a provision for collecting from the customer an amount estimated to cover the shrinkage in value of buildings and equipment through use, decay or obsolescence. The amount included in this example covers only that incident to pattern shop operations.

Property taxes is the share of levies for real estate and personal property based on the ratio of the pattern shop's building, equipment and inventory values to the building equipment and inventory values of the entire foundry.

Property insurance is the share of insurance premiums paid on account of buildings, equipment and inventory, based on the ratio of the pattern's shops building, equipment and inventory values to the building, equipment and inventory values of the entire foundry.

Power is the proportion of the payment for electric current used in lighting the building and running the machinery chargeable to pattern shop operations. This proportion is determined on the basis of wattage for lights and horsepower hours for machinery operations. Horsepower hours being the result of multiplying the normal horsepower rating by the hours operated.

Air is the portion of the cost of operating the air compressor chargeable to pattern shop operations. This portion is based on the number and size of outlets and the hours used as compared with the numbers and sizes of outlets and hours used in the whole foundry.

Include Repair Costs

Maintenance and repairs covers the cost of repairing and replacing items of plant assets comprising buildings and equipment. These costs may be materials purchased expressly for this purpose, materials taken from the company stock room, labor or service performed by the pattern shop itself. Those are shown in "Pattern Shop Cost" under "Production Cost" in the accompanying chart.

Supplies covers the cost of various supplies and small tools, including certain direct materials that can not be practically charged to jobs, used in connection with pattern shop operations.

Supervision is the cost of effort in planning and supervising the activities of individuals engaged in operating the pattern shop. The amount in the accompanying chart represents the salary, in full, of the foreman of the pattern shop because he spends all of his time in supervision. In many pattern shops the foreman works on production jobs part of his time. To apply such costs to jobs sensibly, the time on each job should be evaluated at the usual wage rate of the employe regularly assigned to that class of work and the amount deducted from the supervision cost.

Clerical covers the cost of one or more individuals who keep time of the operating employes in the pattern shop together with following up orders, running errands, etc.

Employe taxes and insurance cover the committments for old age benefits, unemployment insurance and state compensation or accident insurance. These amounts being based on the current wages of employes in the pattern shop.

Indirect labor covers the compen-

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sation of employes in the pattern shop that can not be practically charged to jobs, supervision or clerical.

Share of general office is an estimated amount of service rendered by the general office staff consisting of purchasing, bookkeeping, payroll calculations and records, cost keeping, general manager's salary, office supplies, etc.

The sum of these burden charges is the burden cost for the month's pattern shop operations, and is allocated to the several classes of production on the basis of direct labor hours. Those are indicated by the "Time" and "Burden" columns in the accompanying chart.

The several classes of work in the pattern shop are done by the authority of work orders. These work orders are of two classes:

1—Jobbing
2—Continuous

A jobbing work order covers the performance of a specific piece of work as shown by form No. 1.

A continuous work order covers the performance of the same class of work during each accounting period (usually one month) as illustrated by form No. 2.

There are many order forms equally as workable as those shown. The important consideration of the form being to sufficiently explain the work to be done to insure intelligent collection and disposition of costs.

Use Standard Forms

Forms for the collection and reporting of materials, labor and burden costs of both jobbing and continuous orders are the same as those used by the company in collecting and reporting other operating costs. Important consideration being that the materials quantities and costs be recorded in strict conformance to quantities actually used and actual expenditures for the same materials. Also that the actual costs of labor and the pattern shop burden applicable thereto be included in the cost of the job or class of work causing it.

At the close of each accounting period (usually a calendar month) a summary of pattern shop costs is made as shown in the accompanying chart on "Pattern Shop Cost." This procedure brings together the material costs for the several classes of work done in the pattern shop during the period; the time spent on each; the labor costs; and the application of the total month's burden to the several classes of work on the basis of time consumed. The sum of the material, labor and burden costs of each class being included in either:

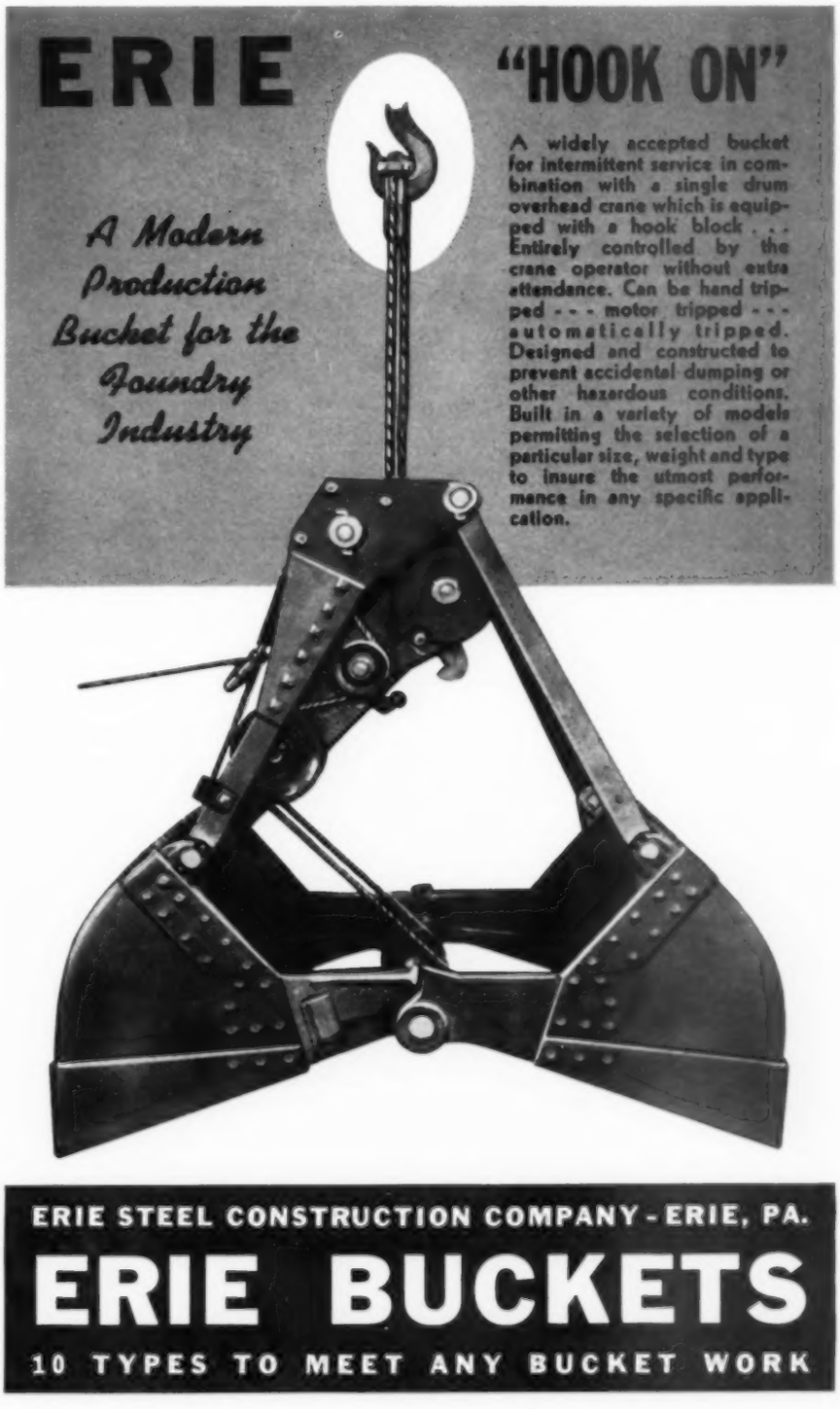
Burden of foundry departments served as indicated by designation 4 on the accompanying chart.

Deferred Charges shown by designation 5 on the accompanying chart.

Shipments depicted by designation 6 on the accompanying chart.

By this procedure each foundry department, representing a particular kind of operation, is charged with the pattern shop cost of service rendered to it. This procedure also segregates the pattern shop cost of service to individual jobs for each customer, thus permitting of a more factual analysis of costs and profits, as illustrated by "Shipments" on the accompanying chart.

Many costs of jobs performed in the pattern shop are of such a continuing nature that charges of these costs to customer's profits and losses should be extended over a number of shipments. A suggested form "Deferred Charges" is shown, that will record the original cost of the pattern work for the job and a provision for charging a predetermined cost per casting to profit and loss as shipments are made and indicated by designation 7 on the accompanying chart. The deferred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costs being carried on the company balance sheet as an undistributed asset. Balances remaining in these deferred accounts when shipments have ceased should be closed out to the company surplus account. This is done because either the predetermination of the number of pieces to be charged was miscalculated or the order cancelled and has no bearing on the costs of other jobs in the foundry. Charging these unused deferred pattern costs to the regular foundry burden would unjustly increase the costs of other jobs not in any way responsible for the conditions.

The forms and figures shown have been used to illustrate the principles of practical cost accounting for pattern shop activities and not recommended for actual measurement of costs in the foundry of any reader. However, the author trusts that this presentation will assist some foundrymen to analyze their pattern shop activities and possibly improve their present methods of collecting and applying the costs to the jobs causing them.

Harvey S. Pardee & Associates, 1512 West Lake street, Chicago, has been organized by Harvey S. Pardee, and Roy G. Roshong, to engage in engineering and metallurgical practice springing chiefly from the war program. Mr. Pardee, a consulting engineer, will devote his attention to machine design engineering, applied physics and mathematics. Mr. Roshong, formerly chief metallurgist, Lindberg Steel Treating Co., Chicago, will center his activities on metallurgical investigations, etc.

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Form Steel Casting Advisory Committee

A steel casting industry advisory committee was formed Feb. 12 by the Bureau of Industry Advisory Committees of the War Production Board. C. E. Adams, chief, Iron and Steel Branch, is government presiding officer. Committee members are:

D. C. Bakewell, vice president, Union Steel Castings Co., Pittsburgh; William E. Butts, vice president, General Metals Corp., Oakland, Calif.; Herbert Farrell Jr. vice president, Farrell-Cheek Steel Co., Sandusky, O.; Burtner Fleeger, president and general manager, Oklahoma Steel Casting Co., Tulsa, Okla.; T. H. Harvey, vice president and secretary, Ohio Steel Foundry Co., Lima, O.; Oliver E. Mount, secretary-treasurer, American Steel Foundries, Chicago; Frank M. Robbins, president, Ross Meehan Foundries, Chattanooga, Tenn.; C. L. Snowdon Jr., vice president, Reliance Steel Casting Co., Pittsburgh; Charles J. Symington, president, Symington Gould Corp., New York; Charles P. Whitehead, vice president, General Steel Casting Corp., Eddystone, Pa., and William H. Worrilow, president, Lebanon Steel Foundry, Lebanon, Pa.

Book Review

Foundry Practice, by C. E. Schubert, assistant professor mechanical engineering, University of Illinois, paper, ring binder, loose leaf, 142 pages 5¼ x 8¼ inches, supplied by the University Book Store, Urbana, Ill., for $1.70 plus six cents postage and tax.

Designed primarily for engineering students taking foundry practice at the University of Illinois, this manual attempts to give an elementary and fundamental knowledge of the principles and practice of bench molding, machine molding, bench coremaking, machine coremaking, nonferrous molding, melting practice ferrous and nonferrous, metallurgy of plain and alloy cast iron, operation of the cupola, calculation of charge, physical testing, physical properties of molding and core sands.

BLOWS MOLDING SAND INTO CORES

(*Continued from page* 64)

travel toward the pouring station and eventually to the shakeout station. Two men work on the job, one makes the molds while the other makes the cores. There is no sharp line of demarkation. The team works in close knit harmony. Either member of the team occasionally finds opportunity to do a little preliminary work on the other man's job. Thus the work progresses constantly at high speed with neither man waiting for the other to complete a given link in the cycle of operation.

The metal half corebox is placed on the roller conveyor and shoved under the magazine of the core machine where suitable stops and guides locate it accurately under the second half of the corebox attached permanently to the base of the magazine. The lower half is lifted mechanically and held in close contact with the upper half. The air control valve is opened and sand from the magazine is driven into the two corebox cavities through two individual openings, each 1-inch in diameter. Compressed air on this operation is maintained at a pressure of 100 pounds per square inch.

Cores Are Rolled Over

The lower half corebox containing the two complete cores is lowered back to place and shoved along the conveyor to a point a few feet distant where the drag, face down, is placed on the corebox. The assembly then is shoved into a roll-over device where it is inverted and lowered on to a continuation of the roller conveyor. The half corebox attached to the frame of the roll-over machine is inverted back to the original position and once more shoved under the core blowing machine. The drag is covered by the cope and the entire mold placed on the adjoining mold conveyor.

Each core is reinforced with a 1-inch diameter cast iron arbor which extends approximately an inch beyond the core print at each end of the core. The arbor is fluted on the cope side to hold a ¼-inch rod. Arbor and rod are placed in the corebox before it is shoved under the blowing machine. After the half corebox and drag are rolled over the rod is removed to form a vent opening through the center of the core. Arbors remain in the molds as far as the shake out station where they are removed from the castings, loaded in small boxes and returned to the vicinity of the core blowing machine.

Mechanical ingenuity and advanced foundry practice characterize practically all sections of the foundry where approximately 160 tons of iron are poured daily into a wide variety of small castings, principally for the automobile industry. Method and equipment for molding pistons eight in a flask are shown in Figs. 2, 3 and 4. To secure accuracy of position and firm anchorage, the dry sand cores are set into suitable openings in the drag pattern plate. The print which projects above the pattern plate is flared slightly to afford the green sand in the mold a more solid grip.

The circular metal band around the print and shown in Fig. 3 is the runner from which a number of small, thin gates deliver metal to the mold cavity. This runner and other parts of the gating system are shown in Fig. 2. Metal is poured through two sprues in the cope, with each sprue feeding the gates to four castings. Part of the runner in the center of each group is in the cope and part in the drag. The metal first goes down and then rises

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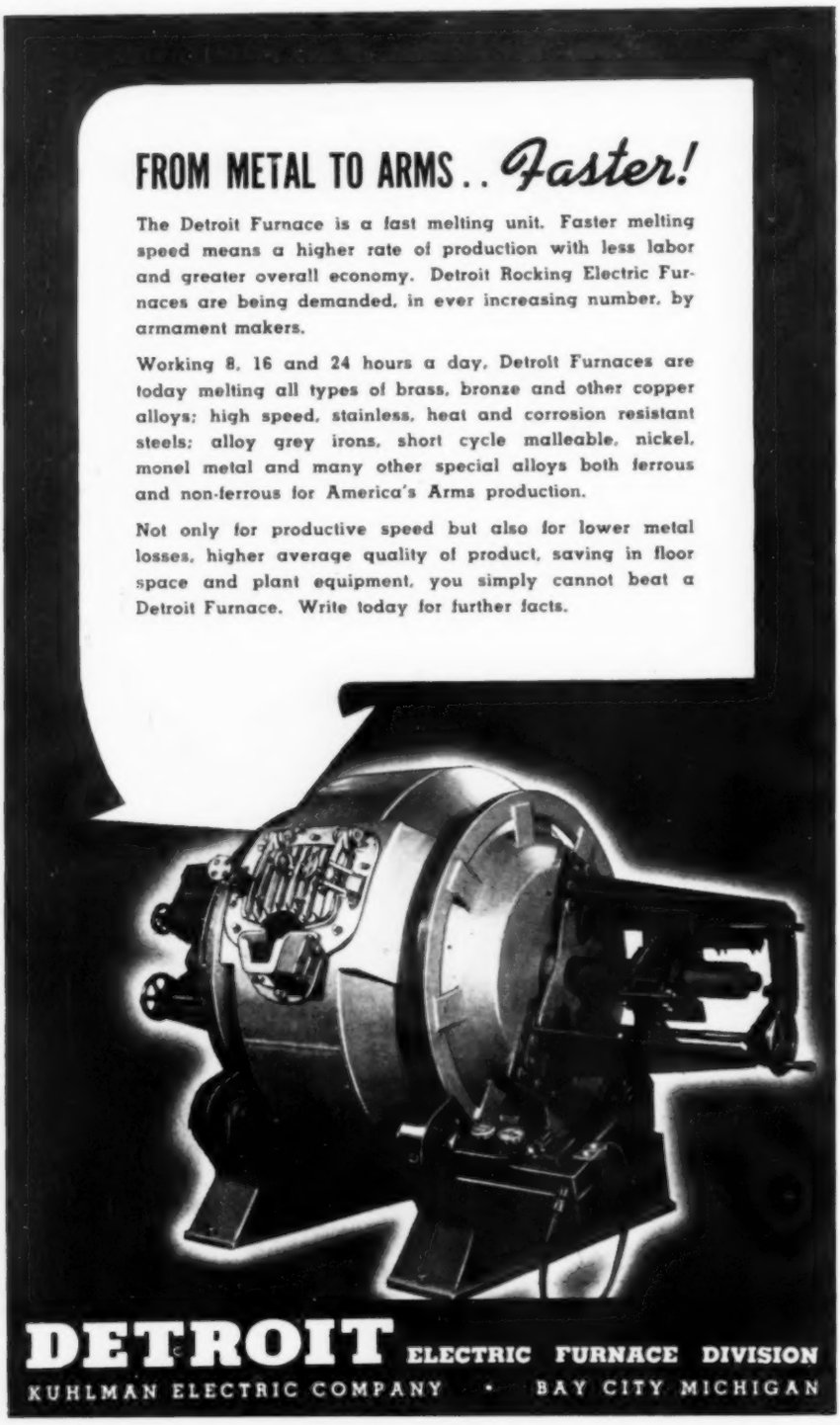
through a strainer core before it enters the circular runner around each core. The metal is tapped from the cupola at a temperature of 2800 degrees Fahr. and delivered to the pouring station so rapidly on a monorail system that the drop in temperature is negligible.

Cope and drag flasks are barred. The cope bars come flush with the top of the flask while the drag bars do not extend to the bottom. This arrangement of the drag conserves sand and also provides an open space for the free exit of core gas. Molds are made on combination jolt and squeeze machines. Squeeze boards are equipped with blocks which descend between the bars and squeeze the sand to the proper density. This feature is shown in Fig. 4. The two smooth and tapered openings leading to the sprues are formed by polished metal projections on the board. The straight sprue openings are formed with a sprue cutter. As a result of these various precautions it is claimed the casting loss is almost infinitesimal.

Three conveyor lines extend through the shop and are served by molding machines made by the International Molding Machine Co., Chicago, Milwaukee Foundry Equipment Co., Milwaukee, and the Osborn Mfg. Co., Cleveland. Molds on two conveyor lines are made in flasks which fall off the end of the conveyor. When the sand falls out, the flasks are retrieved and placed on a conveyor which carries them back to the molding station.

Molds on the third conveyor are made in snap flasks, therefore there are no flasks around the sand molds when they reach the shakeout. As they round the turn at the end of the conveyor, each sand block comes into contact with a steel plow set at an angle. In this manner they slide toward the outside edge of the conveyor and tumble off by gravity. A very simple rig, and like the majority of simple things, highly efficient. Sand falls through a vibrating screen on to a belt and is discharged into a bucket elevator which carries it aloft and delivers it to a hopper which feeds the mixers. Later the sand travels on belt conveyors over the hoppers which supply the long, straight lines of molding machines.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Castings Are Annealed

The vibrating screen at the shakeout made by Simplicity Engineering Co., Durand, Mich., is set at an angle of 30 degrees from horizontal so that the castings, gates and sprues falling at the high end hop along by a combination of vibration and gravity and are discharged from the low end into steel tote boxes and delivered to a long battery of tumbling barrels. Approximately 75 per cent of the castings are annealed for 1½ hours at temperatures ranging from 1050 to 1400 degrees Fahr. in two annealing ovens made by the Surface Combustion Corp., Toledo, O.

Iron is melted in two cupolas 55 inches inside diameter, erected side by side and served from a common charging floor. Each cupola is used on alternate days while the second cupola is undergoing repairs to the lining. To insure regularity in tapping and to maintain a definite height of molten iron in the well a number of electrical contact points are inserted in the brick lining at two levels. These in turn are connected to two small red and green signal lights attached to the wind belt on the opposite side of the breast to where the cupola tender stands.

When the upper or green light shows, the cupola is tapped and the stream is allowed to run until the metal in the cupola drops to a predetermined level. The tap hole then is stopped and remains stopped until the metal rises to the level which flashes the green light. A similar signal is mounted on the wall in

the superintendent's office to enable him to keep in close and intimate touch with the cupola operation.

The metal is taken away in 1500-pound ladles and transferred to a number of 300-pound bull ladles suspended from a monorail system extending to the various pouring stations. Each ladle hangs from an individual hoist with finger control within reach of the operator.

Addition of alloys to the base mixture to meet different specifications is made through a special type covered cupola spout invented by Mr. O'Brien. A description of this interesting and highly efficient development will be presented in an early issue of THE FOUNDRY.

Book Review

Eye Hazards in Industry, by Louis Resnick, fabrikoid, 321 pages, 6 x 9 inches, published by the Columbia University Press, New York, for the National Society for the Prevention of Blindness, and available for $3.50 .

Estimates indicate that the total number of unnecessary eye injuries in American industry is over 300,000 and the total cost of those injuries to industry is more than $100,000,000. There is no need for such tremendous waste of workers since causes of industrial eye accidents and diseases are known, and methods of eliminating the hazards or protecting the workers against them are available.

Hence, this book is timely since it discusses the subject of industrial eye hazards thoroughly in a concise manner. Essentially the book is divided into three parts comprising 14 chapters. The first part relates to the problem and contains 5 chapters. Those cover eye hazards, eye accidents, eye diseases, defective vision and first aid. The second part termed the solution also contains five chapters concerned with mechanical guards, process revision, proper lighting, education and administrative supervision. The third part comprises four appendices on a self-appraisal for eye safety in industry, industrial poisons which are hazardous to the eyes, recommended minimum standards of illumination for industrial interiors, and some national organizations concerned with industrial welfare.

George R. Hanks, president of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., which this year is celebrating its 200th anniversary, has notified the company's 1800 employes that a $25 defense bond will be presented to each baby born to an employe during 1942. The Taylor-Wharton company, which has plants in Easton, Pa., and High Bridge, N. J., has been in operation continuously since 1742 when the original forge was built on the site of its present plant at High Bridge.

Improves Plant

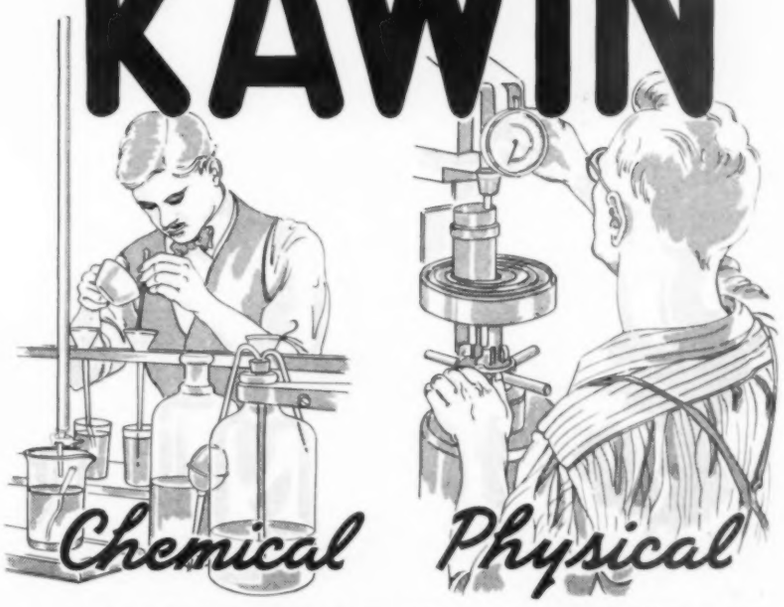
The Ironton Fire Brick Co., Ironton, O., during the past year has made a number of improvements in plant and equipment to increase productive capacity. Items include extension of special shapes department, a new drying system a new repair shop improvements in tunnel dryers and a new pyrometer system on the kilns.

Moves Office

F. W. Marshall & Co., Philadelphia, selling agents for ore, coke, pig iron and ferroalloys, is moving Feb. 1 to room 1306, Philadelphia National Bank building, 1416 Chestnut street, Philadelphia, from the Pennsylvania building, Chestnut and Fifteenth street, where the company had been located for 30 years.

"Handbook of Federal Labor Legislation" recently has been published by the United States Department of Labor as bulletin No. 39, part II of labor laws of general application.

KAWIN



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PLANNING THE NONFERROUS FOUNDRY

(*Continued from page 74*)

Let us consider the problem as an example of small castings such as small valves or fittings. They arrive in the cleaning room attached to their gates containing many cores. Possibly they may have been plunged in the water in the foundry to blow out the cores resulting in castings that are more or less free from cores but do have gates, risers and sprues attached to them and probably some fins.

The castings first go to the necessary machines for the removal of gates, risers and sprues. Either band saws, power saws or some kind of cutting-off wheels are used or in some instances to benches where hand saws are applied to remove the gates. It will thus be seen that the location of the machines for the removal of these gates, risers and sprues should be at the point most convenient to the castings as they first arrive from the molding floors of the foundry.

As the castings are freed from gates and therefore become individual units they should feed progressively to such other machines as will be needed for their complete cleaning. Such machines might be grinders, abrasive blast or water blast machines, tumbling barrels and the like. Some castings will have to go to bench hands who will do a final cleaning of loose sand or wires and possibly apply a file or rasp to complete the necessary cleaning job before the castings go to the sand blast for final cleaning before transmission to the inspection staff.

In the case of larger castings than those just described the process may be similar with the difference that on account of the larger size additional problems arise or additional machines are necessary. Therefore, the planning of the cleaning room may be somewhat different. In any case unless the castings are so large that they must be moved along on trucks or by mechanical power from one step to the next the engineer can plan a location of his machinery so that proper progression may take place with a minimum of handling and a maximum of production per man per hour.

Machines Remove Gates

The choice of the different types of equipment will, of course, be influenced by the kind of castings contemplated for production. Whether power hack saws or power band saws are to be chosen as cutting-off mediums will be much influenced by the type of work and the type of alloy as well. There are now machines available that use thin abrasive cutting-off wheels. Those wheels revolve at a relatively high speed and cut a very thin slot removing the casting from its gate or riser.

Such machines are very economical for certain types of work in spite of the fact that they necessarily make a cut that is wider than some of the saws, thus resulting in the reduction of the metal into cuttings in a larger proportion than when a narrower cut is produced by the saw. Since brass and bronze foundries operate in the production of high priced metals these metals are worth very much less in the form of cuttings or borings than they are in the form of ingots or chunks. Hence, the less metal removed by the cutting-off machines and converted into chips the less waste of these expensive metals by these cutting-off processes.

Many foundries must produce their castings for sale in the rough and their appearance in this rough state is important from a sales standpoint. Consequently, to mar

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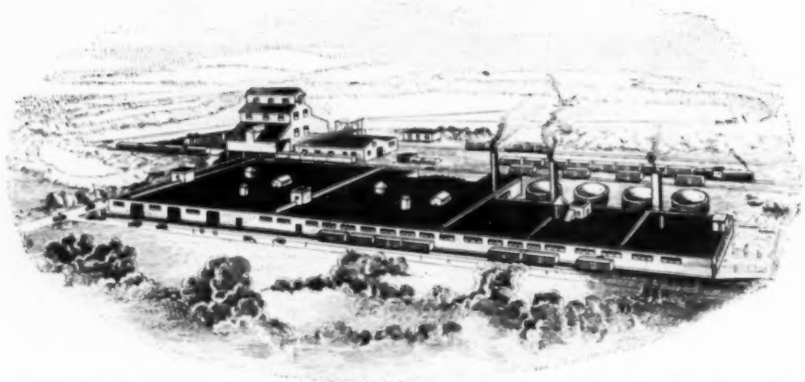

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or bruise them in any way in the process of cleaning is inadvisable from a sales standpoint. To discolor them may result in confusion that must be explained and to make explanations is always best to be avoided from a sales standpoint. Consequently, in planning the type of cleaning of castings one should take into account the effect resulting from any given method of cleaning.

For example tumbling castings does tend to bruise and mar sharp corners particularly where this tumbling takes place in masses without proper precautions. If water tumbling is necessary to clean castings or to produce the surface desired it may be found necessary in many instances with some particularly sofe alloys to have quantities of wood chips or sawdust in the water tumbling barrel to reduce the bruising effect resulting from this tumbling.

Blasting with metallic shot tends to discolor some types of bronze and cause a blackening effect that may be avoided by the use of flint, sand or other types of hard sand blast sand. There are a number of very good well cleaned and very satisfactory sands available some of which have exceedingly good cutting ability and therefore require a minimum amount of time of exposure of the castings to the blasting process. This means a minimum amount of tumbling around under the blast and consequently a minimum of harmful bruising of the surface by impact of one casting against another.

Cleaned By Blasting

Air pressure used in blasting should be considered carefully by the engineers in charge in order to employ that pressure which produces the best results with the minimum amount of harmful effects and also with the minimum cost for air compression. Where centrifugal blast is used a careful choice of the right machine for the right job should be made to insure the best results just as this fact is also true where air blast or water blast is used.

In some foundries the men doing the cleaning of the castings are looked upon as inspectors as well. The author believes that this viewpoint gradually is being recognized as erroneous. In other words we believe that the process of cleaning is a definite one that should be done by those who have acquired the greatest skill in doing it. Consequently, they can obtain the maximum production with a minimum amount of labor and power and other expense.

Inspection should be done by those who have studied the problem of inspection to the point where they are particularly adept at recognizing surface conditions that are indicative of subsurface defects. They also are able to read blue prints and other drawings in order to check castings for accuracy and to recognize castings that are coming through in incorrect shape. It is not an uncommon thing to have castings pass through the entire process of production to the inspection room and find that through an oversight a core never was placed in the mold or it was inverted or part of the pattern was lost.

Nobody recognized it until the castings reached the inspection department and were checked by those who were competent to check the castings against blue prints. It will therefore be found exceedingly efficient and helpful if in planning a foundry immediately after the castings have been completed in their several processes of cleaning they pass into a separate department provided for their rigid inspection before transmission to the shipping department or the machine shop.

In that inspection department should be located all such necessary equipment as will be needed to insure the uncovering of any error in production that would result in

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defective castings and even to the point of checking for hardness on brinell, scleroscope, etc. apparatus or checking for uniformity of wall thickness by calipers, etc. and checking for uniformity of casting in general by the determination of average weight per unit.

The inspection department also may function as a recording department where the necessary records originate to indicate the number of good castings produced per unit of time, the number of bad castings for the same time, the number of castings produced by any one molder where piece work is the rule, the different kinds of alloys and their relation to the general items of cost. All those records could originate in the inspection department as a routine part of inspectors' duties.

Therefore, we believe we are correct in recommending the incorporation of a definite inspection department adjacent to the cleaning department but manned by a different crew of expert inspectors properly equipped and with its equipment so located that work may progress with a minimum of labor expense. Such arrangement will complete the development of the foundry unit with its foundry where the castings are made; the core room where the cores are made to supply the foundry, and the cleaning and inspection rooms where the castings are completed for shipment.

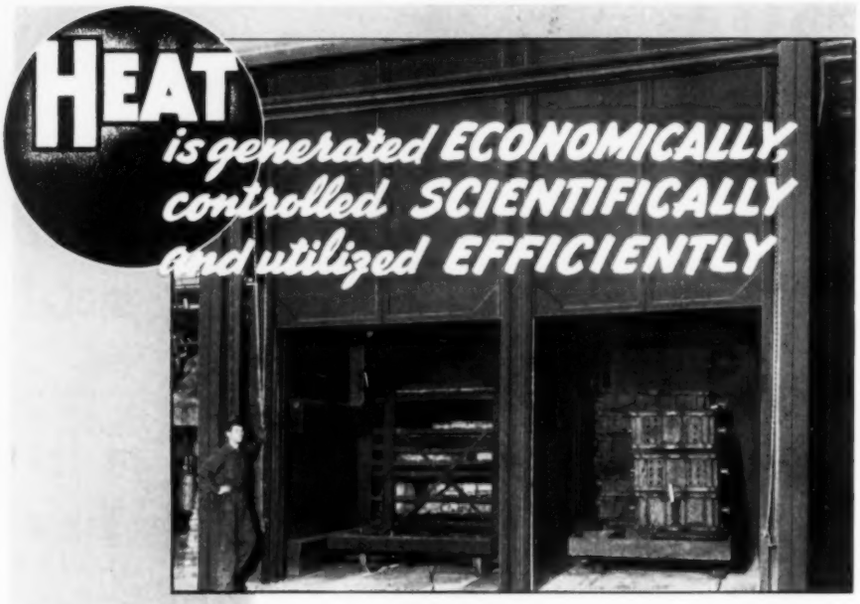
In our next installment we shall discuss the necessary planning of the equipment in the metal room which supplies the metals to the furnaces and the furnace room in regard to its equipment.

In the nonferrous foundry there are such a wide variety of different compositions regularly produced that this problem of a properly equipped metal room is of a very great importance. It ties in with the cleaning room because in the cleaning room the gates are removed from the castings made from a variety of compositions. To prevent difficulty the gates from castings of one composition must be kept separate from those of other compositions and returned to the metal room where they can be identified properly and thus fed into the next charge of that same composition.

Thus it will be seen that in planning the cleaning room the question of different types of alloys influences the progress of gates and castings through the cleaning room and must be taken into account. Plans must be made to segregate definitely each different composition from all others and keep it so segregated as it progresses through the cleaning room so that when the cleaning room delivers the castings to the inspection room they can still be separated by alloys or compositions. Consequently any error in the production of a given casting from the wrong composition can be recognized promptly by the inspection department in time to reduce the cost of these errors to a minimum.

This is the fourth article of a series on the subject of planning the layout of a nonferous foundry. The series began in the December, 1940, and succeeding articles appeared in the January and February issues. The fifth will be published in an early issue.

THE EDITORS.



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Observes Fiftieth Anniversary

Mathieson Alkali Works Inc., 60 East 42nd street, New York, manufacturer of fused alkalies and other chemicals used in metallurgy, is observing its fiftieth anniversary. The company was incorporated in Virginia in 1892. With plants in Saltville, Va., Niagara Falls, N. Y., and Lake Charles, La., the firm is one of the major producers of alkalies, chlorine, synthetic ammonia and numerous other products. At present, all three plants have been geared to maximum production to supply chemicals vitally necessary to our all-out war effort.

FOUNDRIES GIRD FOR WAR DEMANDS

(*Continued from page* 71)

properties and their lighter unit weight as compared with carbon steel, are factors that are being recognized to the advantage of the industry.

Use of Control Equipment Extended to All Steps In Processing

BY HARRY W. DIETERT
President
Harry W. Dietert Co., Detroit

THE additional burden placed on the casting industry by the scarcity of suitable raw materials, has necessitated the use of practically any type of scrap that may be available, and has increased operating expenses. This situation will bring greater emphasis on production efficiency.

American industry is awakened as never before to the fuller use of adequate control equipment so that quadrupled production will not entail the slightest sacrifice in quality. Control in the foundry, whether ferrous or nonferrous, no longer implies the checking of the finished product as much as it means regulating the various steps involved in the processing of a metal. Regulation permits standardization. Mass production of articles to precise specifications cannot be achieved as the result of individual skill but as the result of adherence to established routine. The regulating of a routing process so that it will at all times conform to a selected standard is the primary functiion of control. The casting industry will bend its efforts in that direction.

Formulate Specifications For Grading Pearlitic Malleable Iron

BY A. L. BOEGEHOLD
Head, Metallurgical Department
General Motors Research Laboratories, Detroit

PROGRESS in the manufacture and utilization of pearlitic malleable iron deserves some comment in summarizing developments of 1941. During the year a group composed of representatives of a number of malleable iron producers have formulated specifications for three grades of pearlitic malleable iron. This had become desirable as a result of the adoption of this material for certain components of some defense weapons. Three grades are specified according to tensile properties and hardness as follows:

Grade *A* with a tensile strength of 80,000 pounds per square inch; a yield point of 60,000 pounds per square inch; an elongation of 2.5 per cent, and brinell hardness of 197 to 241. Grade *B* with a tensile strength of 70,000 pounds per square inch; a yield point of 48,000 pounds per square inch; an elongation of 4.0 per cent, and a brinell hardness of 163 to 217. Grade *C* with a tensile strength of 65,000 pounds per square inch; a yield point of 45,000 pounds per square inch; an elongation of 6.0 per cent, and a brinell hardness of 143 to 179.

In addition to uses for defense purposes, one of the outstanding developments of the year was the substitution of this material in place of aluminum for automotive pistons. Due to the high strength and modulus of elasticity of pearlitic malleable iron it is possible to make a piston with a weight intermediate between the weights of aluminum pistons and cast iron pistons. The

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loss of aluminum for pistons as a result of priority regulations would ordinarily have caused a change back to cast iron pistons but with pearlitic malleable iron available a number of automobile companies have taken advantage of the properties of pearlitic malleable iron to reduce somewhat the weight increase that would have been incurred by using cast iron as a piston material.

An interesting new development in the manufacture of pearlitic malleable irons and also fully annealed malleable iron is the use of tellurium. Advantages from the use of this element may be realized in two different ways. In light castings, the use of 0.003 to 0.005 per cent tellurium permits the addition of enough additional silicon to reduce materially the time required for annealing. On the other hand it makes possible the casting of heavier sections without the consequent increased annealing time that ordinarily would be caused by the reduction in silicon required to get freedom from mottling in the heavier sections.

By adding 0.005 to 0.006 per cent tellurium, the silicon content may be increased and at the same time freedom from mottling obtained with no increase in annealing time incurred. Advantages derived by this method of procedure are elimination of the necessity of melting a lower silicon iron than customary, and elimination of reduced annealing capacity on account of increased annealing time that would certainly result if a lower silicon iron had to be used to obtain white fracture in the heavier sections.

The process is covered by U. S. Patent No. 2,253,502. An early commercial application of this process was in the manufacture of heavy pistons for rail car diesel engines.

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Attain Improved Properties In Castings Made from Malleable Iron

BY C. G. RAIBLE

Vice President
Fanner Mfg. Co., Cleveland

AS THE war program swings into high gear, it is apparent there is not sufficient capacity for small steel castings. Attention should quickly be given by the proper Army and Navy authorities to the possibility of substitution of small malleable castings. In case these authorities are not aware—vast strides have been made in production of malleable castings in the direction of high tensile, shock proof and wearing qualities which would make them suitable substitutes and would take up capacities which are tending toward idleness.

Cast Iron Scrap Shortage Is Major Problem in Iron Foundries

BY CHARLES HOEHN

President
Enterprise Engine & Foundry Co., San Francisco

SHORTAGE of cast iron scrap has become a major problem in the production of iron castings, and is being met quite successfully by the substitution of more than 50 per cent of steel scrap with the necessary cupola additions to develop the required metallurgical analyses.

Shortage of crankshaft forgings for diesel engines up to 1000 horsepower is being supplemented quite successfully by the use of special cast iron and steel crankshafts.

The use of exhaust gas superchargers on some of our diesel engines is creating from 30 to 40 per cent more horsepower for the same size and weight of engine, thereby saving the difference in weight and a large part of the cost required to produce the higher horsepower engine.

Rising Interest Observed In Bessemer Process For Steel Castings

BY M. F. BECKER
Vice President
Whiting Corp., Harvey, Ill.

ONE of the most noticeable trends in the castings industry is the rising interest in the bessemer process. Due mainly to the development of a practical method for desulphurizing cupola iron, which gives easy control of the sulphur content and the introduction of electric eye control, the side-blow converter is returning to favor and doing a good job.

The side-blow converter has also proved itself a practical unit in triplexing systems for continuous pouring of steel castings. One large steel foundry now under construction for defense work will employ four 6-ton side blow converters for this purpose.

Another metallurgical development that is receiving a great deal of attention these days in the system of duplexing whereby iron is melted in cupolas, tapped into huge reservoir mixing ladles and then charged into the open-hearths. This system speeds up production and also reduces the cost of finished product. Several such installations are now under construction. Additional economies are effected by equipping cupolas with hot-blast apparatus.

The casting industry has progressed a long way since World War I, and today many parts can be made successfully of cast metals where formerly forgings were used.

Preparation for Future By Foundry Industry Is Achievement

BY OLIVER SMALLEY
President
Mechanite Metal Corp., Pittsburgh

IN WRITING about accomplishments or trends in the foundry industry during 1941, perhaps it should be emphasized that the outstanding achievement in the industry has been the amount of individual and group preparation for the future. That such planning for the post-war era should go on concurrently with the effort required to solve the huge production problems created by the defense program is not only amazing but a hopeful and healthy sign.

It is becoming a recognized fact that the future of our country—in fact of the whole world—is becoming more and more dependent upon the best use of the most suitable materials to create the most efficient products. The truth of this is evidenced by the great number of successful substitutions or replacements which have been worked out to meet the tremendous demands for materials of construction today.

Along these lines the modern better property castings are making definite contributions. The foundry industry, although faced with many new situations involving raw materials, shortage of alloys, new specifications, and new products, is revealing more emphatically than ever the real progress which it has made in the last ten years.

It is also well to remember that many of the so-called new uses for these high duty castings, although frequently referred to as "substitutions" should, as a matter of fact, properly be called "reversions." The past year has seen numerous examples of products originally designed as castings, which, for obscure and frequently meaningless reasons were converted to welded constructions, forgings, die castings, etc., now finding forgotten and unexpected advantages available when built once again with today's castings.

This is the result in part of one

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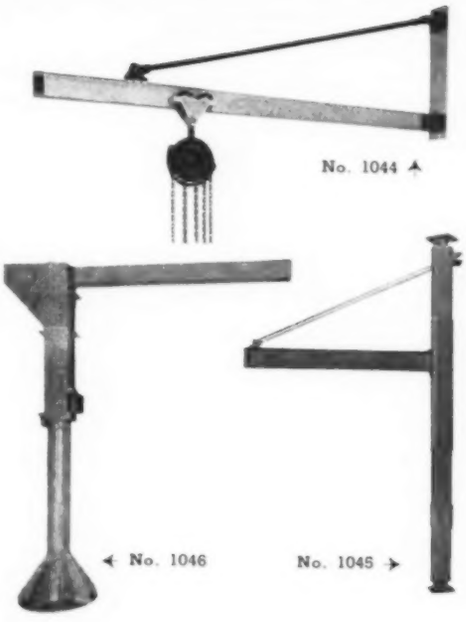

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of the biggest advantages possessed by producers of dependable castings, namely, the fact that the superior properties of their products are inherent in their material as delivered and generally do not depend upon complex and expensive treatments to be given to the material by their customers. In fact, such castings have positively proved by their performance in service that they can be classified as definite engineering materials and, as such, a potential solution to many more present and future problems of industry.

Increased Attention Given To Mechanization Serves Three Purposes

BY DR. JAMES T. MACKENZIE
Chief Metallurgist
American Cast Iron Pipe Co., Birmingham, Ala.

PROBABLY, the greatest activity in the foundry industry has been increased attention to mechanization, with the double, or rather triple purpose of speeding up production, saving labor and making the labor that is left simpler and easier. Anything that can be done by machine is being done that way instead of by hand. Mechanized handling of sand and mechanized shake-out have been especially important moves, although core-blowing machines and molding machines have more than held their own. Naturally, the increased mechanization has demanded uniform sand since the molding machine has no "feel" like the skilled molder. Sand testing equipment is the only satisfactory method of maintaining the necessary uniformity.

In the field of metallurgy a great deal of work has been done on the graphitizing alloys, which are largely based on silicon. This has been of interest theoretically for sometime but the shortage of nickel and copper has given it very great impetus. These graphitizers have been of assistance in the elimination of chill, hard spots, and differences in section sizes, replacing nickel and copper for this purpose with considerable success.

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Production of Malleable Castings Greatest in Industry's History

BY F. O. PARKER
Sales Manager
Acme Steel & Malleable Iron Works, Buffalo

IN ALL probability 1941 will show production of the greatest tonnage of malleable castings in the history of the industry. Early in December most malleable foundries are running at least 75 per cent defense work, and some exceed this quite a little. This defense work, naturally, includes a great deal of truck work, not only on the industrial trucks but all kinds of army and navy trucks, as well as gasoline trucks, armored scout cars, midget reconnaissance combat cars. There are also many malleable castings used in connection with trench mortars, army field range and also many malleable castings used in army tractors. In addition many of the malleable foundries are running on machine tool castings, air compressor castings and castings for electrical trucks. Due to the need of more electrical power, insulator castings are being used to a larger extent. The malleable industry has always depended upon the railroads for some of its business and with the large car building program, foundries have been under pressure to get out railroad parts.

The Malleable Founders' Society and individual foundries have stressed the importance of maintaining and adhering to definite physical properties as well as quality castings in every respect.

TRAINING LABORATORY APPRENTICES

(*Continued from page* 73)

flame used at first to prevent too violent escape of steam. The filter should be tilted on its side slightly and spattering should be carefully avoided.

When the filter paper begins to char the heat can be increased gently but should never be so great as to set the filter paper in flames before the paper has charred and all volatile matter removed. The heat on the crucible should then be raised to redness until ignition is complete and the weight found to be constant.

Careful treatment of analytical balances is absolutely necessary and essential if they are to be kept accurate and dependable. It is expected that everyone using the balances take a personal responsibility in seeing to it that the few simple rules which follow are observed strictly as the reputation of the laboratory for accuracy of chemical analyses hinges upon the condition of these balances.

Careful Treatment Necessary

1. Balance pans should be brushed off and the adjustment of the balance tested and checked before each weighing.

2. To check balances for "accuracy in adjustment" note: (a) Whether balance cases are level; (b) See if pointer rests at zero when the beam is raised from its knife edges, and also when lowered so that the pan arrests touch the pans; (c) See that the mechanism for raising and lowering the beam works smoothly; (d) See that the pan arrests touch the pan when the beam is lowered; (e) See that the needle swings equal distances on either side of the zero point when set in motion without any load on the pans.

If the above features are not exactly right to less than one division on the scale, the balances should be placed in adjustment before any weighings are made.

3. Never touch the pans to set the beam in motion—use the release provided for the purpose—and arrest the swing of the balance gently as the pointer is swinging through the zero point, otherwise knife edges become dull. For the same reason the beam should never be left upon its knife edges. Except in the case of fractional weights, the weights should never be removed from or placed on the pans without supporting the beam.

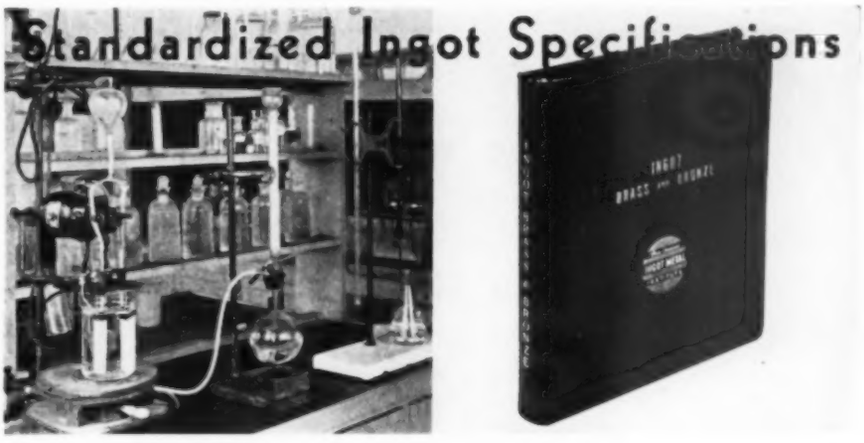
4. When ascertaining the correct weight of a substance, the weights should be applied to the right-hand scale pan in the order in which they occur in the weight box (not haphazard) until the correct weight is obtained.

5. The balance should always be *closed* during the final weighing, when the rider is used, to protect the pans from the influence of air currents.

6. After the weighing is finished, the weights should always be replaced in their proper places in the weight box *and the rider taken off the beam and the door of the balance case kept closed when not in use.* This is an important item.

7. Do not try to remember weights, make the proper entry of the weights in the laboratory notebook. Care should be taken to double-check all weighing results, i.e., add up the weights on the balance pan, then add up the weights again when restoring them to the weight-box.

8. No chemical substance *ever* should be placed directly on the balance pan. Every substance or vessel weighed should be dry and cold. A warm object causes air currents which spoil the accuracy of the weight.



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According to exhaustive laboratory and field reports, this new alloy, known as Ajax *Navy Tombasil*, possesses physical properties far in excess of either Govt. "G" Bronze (88-10-2 and 88-8-4), Spec. 46M6G; or "M" metal, Spec. 46B8G; as well as the Cu. Si. Alloy known as Spec. 46B28.

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9. In case of accidental damage to a balance, or in case a balance is known to be seriously out of adjustment requiring the services of an experienced repairman, a label marked to show *balance out of order*, should be pasted on the glass door of the balance and the Director of the Laboratory informed giving details of the accident or cause of inaccuracy.

First of all, it should be borne in mind that anything worth the effort and time required to run an analysis, or conduct an investigation, should be made a matter of record in a suitable notebook.

A notebook has been provided for routine chemical analyses and another for analyses of inbound materials, scrap, oil, sand, etc., and another notebook for *special analyses*. It is important that accurate record be made in the proper notebook and that complete details—sufficient to identify the analyses at any future date—are recorded.

The making of records of weights, titrations, etc., on loose paper will not be permitted. Orderly entries must be made in the proper notebook *at the time of the observation* and not copied from scraps of paper into notebooks. All records of analysis should bear the *date* and initials of the technician and should be affixed to the analysis.

In cases where two or more persons conduct different portions of lengthy or complicated analyses, the portion of the work performed by each person should be subscribed to by indicating his initials and date. Descriptive notes should mention any special difficulties or happenings encountered during the analysis especially if these are known to have a tendency to promote variations in accuracy.

On important analyses involving disputes, etc., it is imperative that duplicate samples be run simultaneously and a reasonable agreement found before reporting official results. Chemists should check any doubtful or unusual results and be assured in their own minds that their analyses are correct before officially reporting same and subscribing to them in the laboratory notebook. Any record found incorrect on double-checking must be marked *void* and crossed off the record with a blue pencil.

Nothing less than absolute integrity is or can be demanded of a quantitative analyst, and any disregard of this principle is fatal to the successful career of the individual in this or any other laboratory. It goes without saying that anyone deliberately falsifying to analyses immediately will be requested to resign.

The *good chemist* makes best use of his laboratory time by first acquiring a thorough knowledge of the character of the work which he himself has to perform before he undertakes to do the work. Then he arranges and plans the work so that no time is wasted during evaporation of liquids, bringing solutions to boiling point, dissolving substances, and similar time-consuming operations.

Several analyses should be in progress at once (except in the case of routine men or open hearth or air furnace control), but care must be exercised to avoid confusion and getting analyses mixed up. Use of a glass-marking pencil on containers will assist in preventing this, and the practice of marking containers must be followed.

EXAMINATION NO. 1

For Laboratory Apprentices
Given—April 12, 1941

(1) Describe step by step the procedure for analysis of chromium, silicon, and nickel in (a) 2 per cent nickel *steel*, and (b) 4 per cent nickel *iron*.

(2) (a) How would you check the Leco carbon determinator to assure that there are no leaks in the system?

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Processing of Magnesium Can Now Be Done Safely

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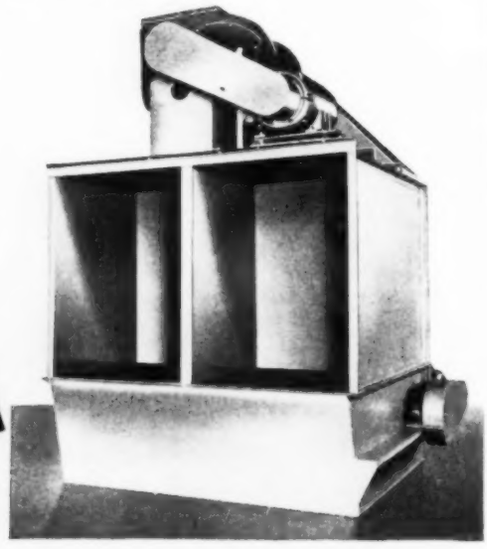

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(b) If results run consistently high, what would you do to remedy this condition?

(c) If results run consistently low, what would you do to remedy this condition?

(d) How do you check the carbon determinator and train for accuracy?

(e) What size samples are used for carbon determination?

(f) What size sample is used for sulphur determination?

(3) How is a *blank* determination run on a standard potassium permanganate solution?

(4) What is the average phosphorus content in

(a) A steel roll heat

(b) A plain carbon heat

(c) An iron roll heat

How far above or below the results in (a) (b) and (c) do you think it necessary to recheck your work in case you find your result does not fall within the average range for these kinds of heats?

(5) In tapping roll heats for steel rolls, what element determines the length of time to hold the heat so as to pour near the temperature specified? Is it the manganese per cent? Is it the phosphorus per cent—or what?

(6) Give scrap color marking for the following roll mixes: (You will be graded on any two of the four samples which you select)

(a) C-0.50 to 0.60; Mn-0.85 to 0.95; P-under 0.055; S-under 0.050; Si-0.25 to 0.40; Ni-0.10 to 0.25; Cr-0.75 to 1.00, and Mo-0.40 to 0.50

(b) C-1.35 to 1.45; Mn-0.60 to 0.70; P-under 0.055; S-under 0.050; Si-0.25 to 0.40; Ni-1.30 to 1.40; Cr-0.40 to 0.60; and Mo-0.25 to 0.30.

(c) C-2.25 to 2.30; Mn-0.85 to 0.95; P-under 0.055; S-under 0.050; Si-0.25 to 0.40; Ni-0.50 to 0.65; Cr-0.75 to 1.00; and Mo-0.30 to 0.35

(d) C-0.60 to 0.65; Mn-0.80 to 0.90; P-under 0.055; S-under 0.050; Si-0.25 to 0.40; Ni-0.10 to 0.15; Cr-0.10 to 0.15, and Mo-0.10 to 0.15.

NOTE: Answer two out of the four examples above.

(7) Describe in detail step by step the method used for the determination of manganese in (a) plain carbon steel, (b) a difficult soluble high-carbon steel, (c) an iron sample.

(8) Suppose you had four samples come into the laboratory at once for *rush analysis* for carbon, manganese, phosphorus, sulphur, silicon, chromium, nickel, molybdenum,—which would you start first, and which next, etc. in order to get them all out on time as quickly as possible, and how long (in hours) do you estimate that it should take to make a full report on all four samples?

1—Read the question carefully.
2—Write your answer.
3—When you have finished writing all answers—then go back over the questions one by one and read your answer to the question.
4—When you are certain that you have answered everything that was asked satisfactorily, then fold your paper after writing name on it and place in envelope and seal envelope and leave it on my desk for grading—good luck.

P.S. 70 per cent grade is considered *passing*—and will entitle student to a 4c per hour increase in pay.

90 per cent grade or above will entitle the apprentice to a 6c per hour increase in pay.

TEST NO. 1
FOR APPRENTICES IN LABORATORY

1. Describe in general terms what you understand to be the principles underlying (a) the brinell hardness tester, (b) the rockwell hardness tester, and (c) the scleroscope hardness tester. What are the differences and similarities?

2. What do we mean by: Tensile strength; yield point; elongation; reduction of area.

3. Define: Ingot, bloom, billet, gate, riser or head, cope, drag, cheek, chaplet, chill, core, carbon boil in open hearth steel making,

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LION BINDER - A strong, fast drying paste; tie wires not needed. A strong binder that bakes very fast.

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macro-examination, sulphur print.

4. Describe the selection of and preparation of a specimen for metallographic examination up to the etching of the specimen. Stress the important precautions and techniques to be carefully watched during the polishing operation. Why do we have different grades of cloth?

5. Draw the *Iron-Iron carbide* diagram, giving the approximate percentages, and temperatures and naming the various phases of it.

6. Define: Eutectic, eutectoid, hypereutectoid, hypoeutectoid, critical range, gamma iron, alpha iron, austenite, martensite, pearlite, ledeburite, troostite, sorbite, ferrite.

7. With respect to the heat treatment of steel, what is the function of an annealing treatment, a quenching treatment, a normalizing treatment, and a drawing treatment. How is each one of these treatments conducted, i. e. what is an annealing treatment, etc.

8. What are the differences between steel and iron? What is steel? What is white iron; gray iron?

9. Trace briefly the manufacture of steel from the ore field to a casting in our shop.

10. Name two common etching reagents for micro specimens. What do we mean by 100-X or 500-X?

EXAMINATION IN PHOTOGRAPHY
No. 1
Oct. 31, 1941

1. Explain *in detail* the verigram method of enlarging. What are its advantages and disadvantages as compared with the kodabromide method, for example? How is the contrast control effected?

2. Describe *completely* the making of a photograph—with our century 8 x 10 camera—from the lighting to the finished print. In this describe any special apparatus used. For the subject: "Photographing a machined surface on a piece of steel."

3. Discuss the lens laws and their applications to photography. Use diagrams.

4. Give the functions of the various ingredients of any developer and any acid hardener-fixer. How does a short stop function?

5. In your judgment, what are the qualifications a student should have to be a good photographer—and why?

EXAMINATION IN CHEMISTRY
No. 3
Nov. 1941

1. What is the reaction that occurs when iron ore is added to molten steel?

2. What acid is formed when ammonium persulphate is added to a manganese determination?

3. What is the name of the yel-

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low precipitate formed in a phos. determination? What per cent of it is phosphorus?

4. What is the laboratory rule concerning the handling of dirty glassware?

5. Name four common indicators.

6. What percentage of the element does ferrochrome contain?

7. What precautions must be observed when handling boiling concentrated perchloric acid.

8. How would you sample a large pile of miscellaneous scrap?

9. When making up solutions, must the acid be added to the water, or vice versa?

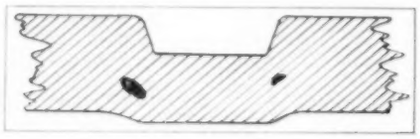
10. What is a bracket; a riser, or head, and what function do they perform?

APPRENTICE EXAM IN GAMMA-RAY WORK

No. 3

Nov. 3, 1941

1. Discuss the gamma-ray with respect to its principal source, type emanation, physical form, comparative wave lengths, penetrating power, etc. How does it compare with the x-ray in these respects?



2. Why are neatness and orderliness in the dark-room essential? What would be the effect if fixer were splashed upon a film before it had been developed? What are the essential characteristics a dark-room worker should possess?

3. Given the task of gamma-raying a casting having the contour and sections shown below, give two ways of gamma-raying this job with one exposure. (There are 3 ways).

4. Explain in detail the operation of the slide rule (gamma-ray) including in the discussion the physio-chemical facts about gamma-rays which are incorporated in the rule.

5. By means of diagrams and discussion, explain how to get the sharpest definition (and why so) by gamma-ray. How can one distinguish between sand, porosity, and shrinkage on the film? Is it possible to miss a crack? If so, how?

This is the second and concluding article of a series on the procedure followed in training laboratory apprentices at the Ohio Steel Foundry Co., Lima, O. The first article appeared in the February issue.

THE EDITORS.

Sterling Grinding Wheel division, Cleveland Quarries Co., has removed its warehouse facilities, machines and stock from 2066 Random road, Cleveland, to 1293 West Ninth street, Cleveland.

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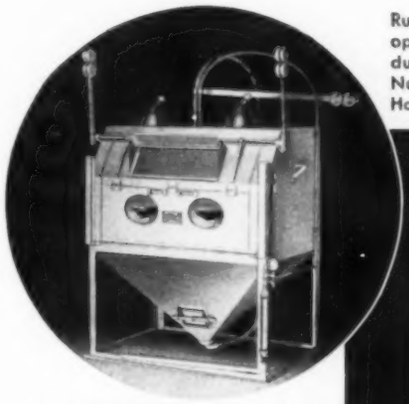

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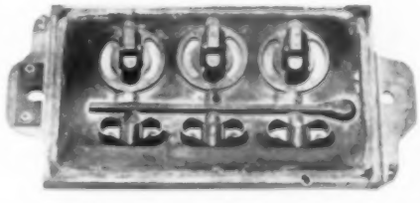

Above is an unretouched photograph of a Tamastone Match Plate after thousands of castings have been run and still in use. Detail perfect!

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Adventures of Bill

(*Concluded from page* 88)

pointed out that when he ordered a suit of clothes, he did not need to tell the tailor how to cut the cloth or fasten the parts together. The same reasoning applies to practically all fields. All he has to do is to tell a foundryman what he wants and the foundryman will deliver the castings.

"However, in the event that a knowledge of the technique employed in making bottle molds is necessary to the development of the proposed improvement in design, I suggested that he visit any plant where bottle molds are made or machined. Regarded merely as a casting, a bottle mold is one of the simplest products of the foundry. It is made in halves provided at one side with lugs for hinges. The cavity in each half is formed with a steel or cast iron core which does not chill, but densifies the iron on the face of the mold. Machining and fitting the two halves of the mold is a job for experts.

"At one time two bottle molds were placed on the floor of the glass factory where they were filled alternately by a glass blower. At present practically all bottles are formed mechanically. Duplicate molds mounted on a conveyor pass in turn under a jet of molten glass and a corresponding jet of compressed air. A few seconds later the molds open automatically, the bottles are removed and the molds close in readiness for the following glass reception. Making the molds involves only simple foundry technique. The great and perennial foundry problem is to develop a metal that will machine to a mirror like surface and at the same time offer maximum resistance to changing temperatures and abrasion. Two articles on glass molds appeared in the August and September 1940 issues of THE FOUNDRY."

The first film authorized for training purposes by the Office of Civilian Defense, entitled, "'Fighting the Fire Bomb," now is being distributed throughout the United States. It is accompanied by an instruction manual containing supplementary lecture material for a quiz based on the film, and other instructional material. The film and manual constitute official training material approved by the training section of the Office of Civilian Defense. Copies of the film are being made available to state and local defense councils by the Office of Civilian Defense. Prints of the film and copies of the manual may be purchased from Trans-film Inc., 9 Rockefeller Plaza, New York.

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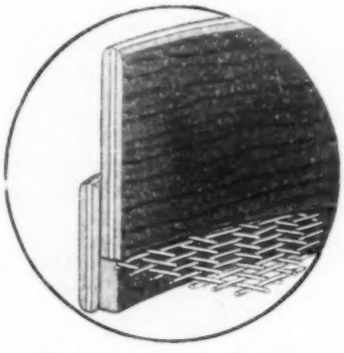

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COST NO MORE

THE CONVERTER'S PLACE IN WAR PRODUCTION

(*Continued from page* 67)

making processes, the converter depends upon oxidation for the refining operation. The five steps in this operation are: (1) melting cycle, (2) superheating cycle, (3) oxidation of metalloids to a very low percentage, (4) removal of excess oxides, and (5) adjustment with recarburizers to the required composition. In the converter this cycle is accomplished in 15 to 17 minutes. Also, oxidation in the converter is brought about by the oxygen in the air blast, while in other processes iron ore is used as the oxidizing agent.

For those who are not familiar with converter practice, it may be well to describe briefly the general outline of operation. The melting rate of the cupola should equal or slightly exceed the amount of metal desired for the converter charge. The purite or other alkali used for desulphurizing is put in the ladle before tapping hot iron from the cupola. By the time the ladle is filled, the desulphurizing slag is thickened by adding burnt lime.

Should Heat the Vessel

The slag is then skimmed off completely. The desulphurized hot metal is now transferred by crane to the converter (in horizontal position) and poured into the nose. The converter for the first heat of the day should be preheated by an oil or gas flame so that the lining is about 2400 degrees Fahr. all through. The first heat usually takes about 20 minutes; succeeding heats average about 15 minutes.

The converter now is tilted back slowly to an upright position so that the metal is just at the lower level of the tuyeres. If in this position the vessel is less than 6 degrees from the vertical, more metal should be added; if more than 10 degrees, some metal should be poured out. It is very important to maintain a proper blowing angle, somewhere between 6 and 10 degrees.

The windbox is now closed and the air turned on. Elimination of the metalloids takes place in three stages: First is the silicon period, lasting about 5 minutes, during which most of the silicon is removed; then comes the boil, a period of violent reaction in which some carbon and most of the manganese is removed; and lastly, the carbon period in which most of the carbon is burned out. All of these stages have distinct flame charac-

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teristics, which enable the operator to know when the endpoint has been reached.

Today the electric eye automatically plots a curve, registering the intensity of the flame and the endpoint of the operation is registered very exactly on the chart in the operator's pulpit. This instrument is a great aid in training an operator, and also the apparatus will catch the endpoint more accurately than is possible with the human eye.

The end of the blow is marked by dropping of the white flame and just a trace of brown smoke, at which point the vessel must be turned down and the air turned off. At this time carbon content is about 0.05 per cent and manganese and silicon are about 0.10 per cent. This brings us to the fifth or final stage—recarburizing. Ferromanganese and hot cupola metal are added in the vessel in amounts sufficient to bring the manganese and carbon contents to desired percentage. Ferrosilicon is likewise used to bring up the silicon to desired percentage. Ferrosilicon usually is placed in the ladle and the steel poured over it. A small amount of aluminum — about 1 pound to a ton of steel—is usually a desirable addition.

There is no set analysis as regards carbon and silicon for the materials that make up the cupola charge. As shown in the accompanying table, carbon may vary from 0.25 to 3.50 per cent, silicon from 1.75 to 2.25 per cent and manganese from 0.60 to 0.70 per cent. All three of these elements are eliminated during the blow. That is, they are reduced by oxidation of the blast and replaced at the end of the blow through addition of the proper amounts of cupola metal, ferromanganese and ferrosilicon.

The composition ranges shown in the accompanying table are given as an illustration and should not be construed as setting hard-and-fast limits. By controlling the silicon content of the cupola metal, the temperature of the steel can be regulated between 2900 and 3200 degrees Fahr., the latter being hot enough to pour castings of very light section. The percentage of carbon and other metalloids can be controlled within very close limits.

Because sulphur is picked up in the cupola through contact with the coke, the sulphur content of the molten iron coming from the cupola spout is always higher than in the cold charge. By treatment with alkalies in a receiving ladle the sulphur is readily removed to the percentage desired in the final steel. No change in sulphur content takes place in the converter itself.

To date no practical method exists for reducing the phosphorus content for the production of castings, so that the original charge must not be over 0.04 per cent in phosphorus.

It is interesting to note, however, that a reliable method of phosphorus removal has been perfected and is being used by Gordon Yocum of the Wheeling Steel Corp. for ingot production. This process depends upon treatment of the bessemer steel in the ladle with a mixture of chemicals. The product, in this case, is naturally an oxidized steel known to the mill man as rimming steel. It cannot be used for castings without a subsequent treatment to remove excess oxides.

Recently several large gray iron and malleable foundries have undertaken to equip their plants to produce steel castings using the side-blow converter process. The main point to bear in mind in any discussion of steel melting equipment for casting production, is the fact that successful operation presupposes a certain amount of experience and skill in foundry work. A beginner is bound to run into difficulties no matter what process is employed. In steel castings manufacture, as in all types of business based on technical principles, there is no substitute for experience.

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Book Review

Federal Wage and Hour Law, by Arthur W. Nevins, fabrikoid, 58 pages, 5¼ x 8 inches, published by National Foremen's Institute Inc., Deep River, Conn., and available for $1.50.

This interesting little book written in question and answer form packs considerable information in its pages, and should be of value to executives and business men who are affected by the federal wage and hour law. Its contents are divided into nine chapters covering various phases of the law. The first discusses covered employes, the second is concerned with exemptions while the third relates to the employer-employe relationship.

Chapters four, five and six describe minimum wages, working time and overtime. Records, child labor and enforcement are discussed in the remaining chapters. In numerous cases examples are given to explain clearly the questions involved.

Sixtieth Year

The Springfield Facing Co., Springfield, Mass., manufacturer of foundry facings and supplies, is celebrating its sixtieth anniversary. It was founded in 1882 by L. S. Brown, who was president until his death in 1937, at which time he was succeeded by H. E. Beckman.

WHERE-TO-BUY

The following classified list of advertisers according to products is conducted for the convenience of our readers in quickly locating sources of all types of foundry equipment and supplies. If you are seeking information on any product not listed in this directory, a letter or post card addressed to THE FOUNDRY, Penton Building, Cleveland, will bring you this information by return mail.

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Macklin Co., Jackson, Mich.
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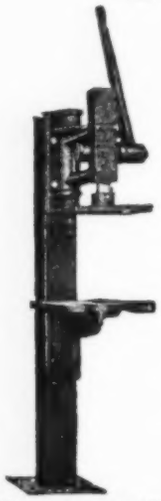

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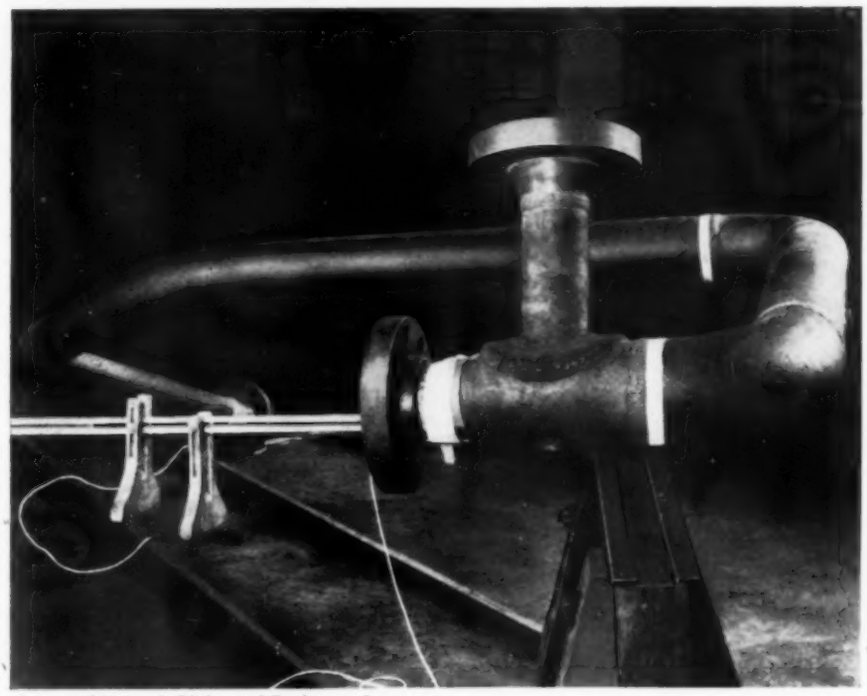

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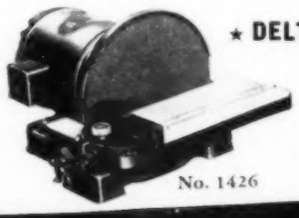

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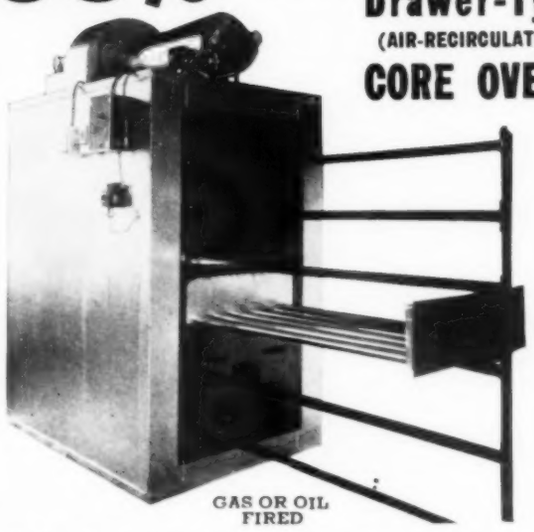

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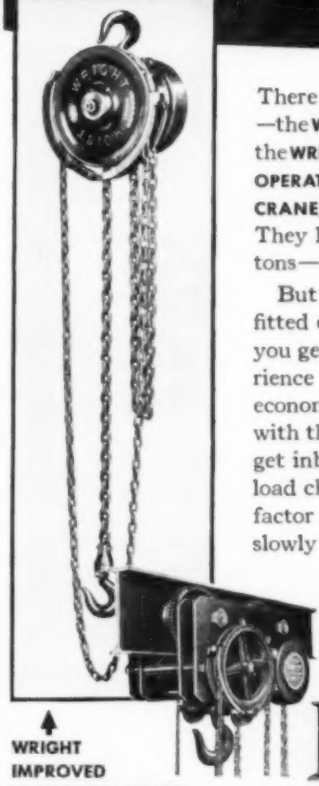

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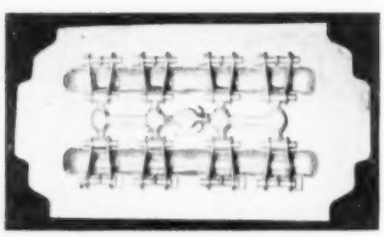

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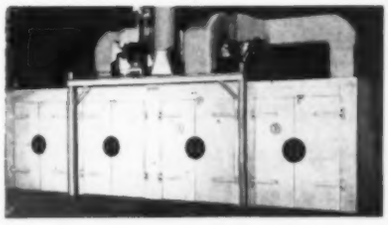

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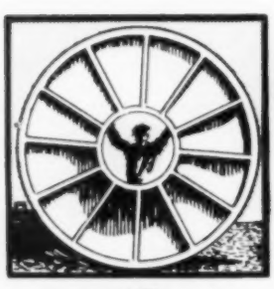

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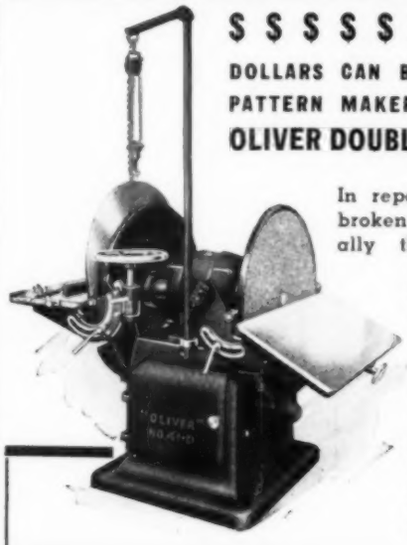

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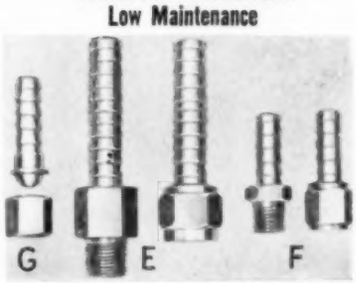

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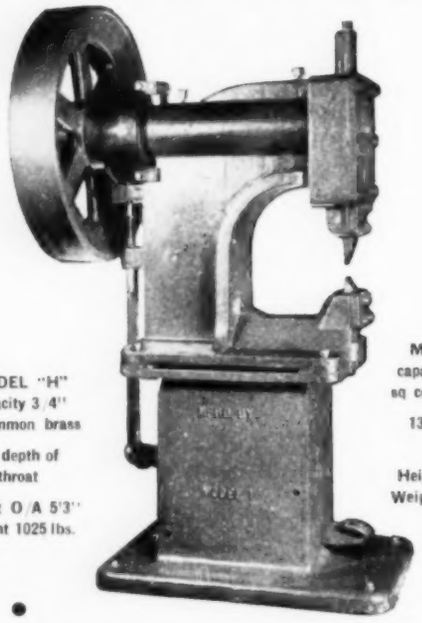

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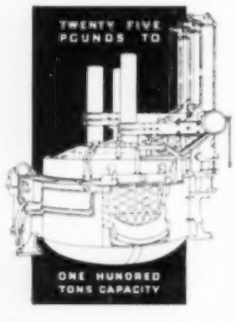

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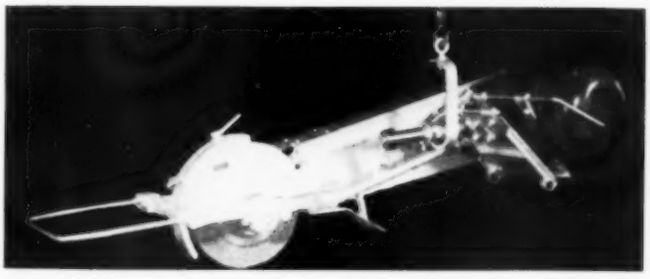

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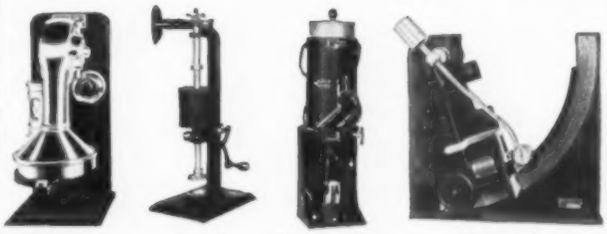

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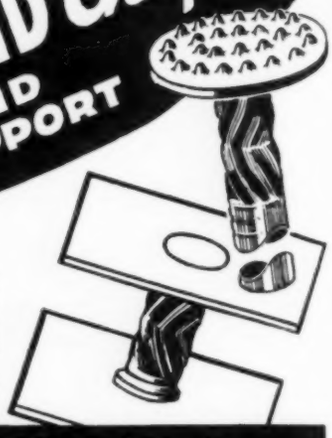

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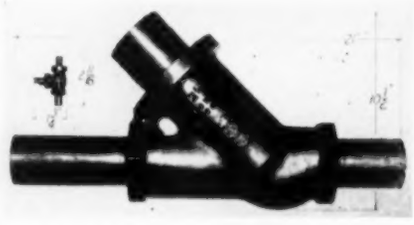

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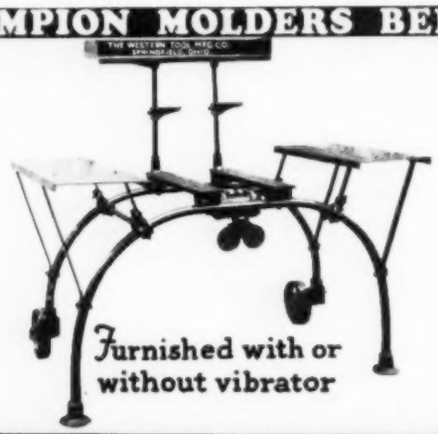

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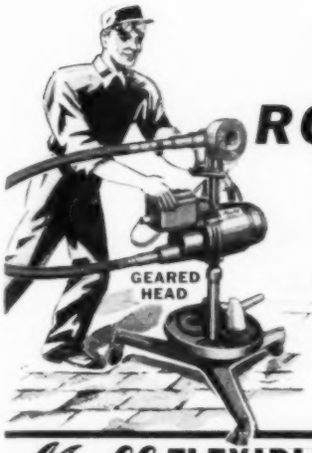

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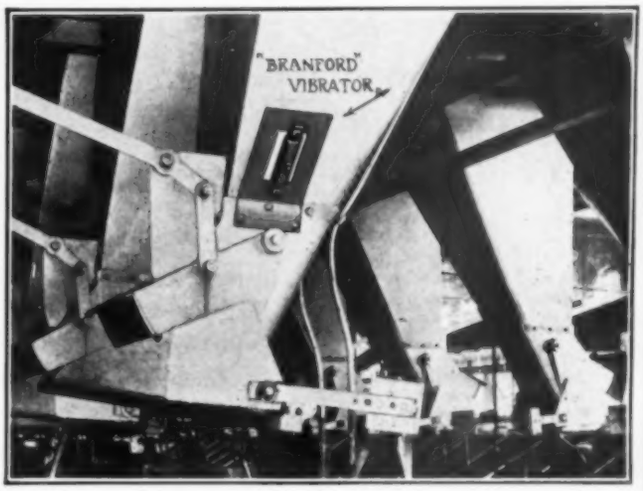

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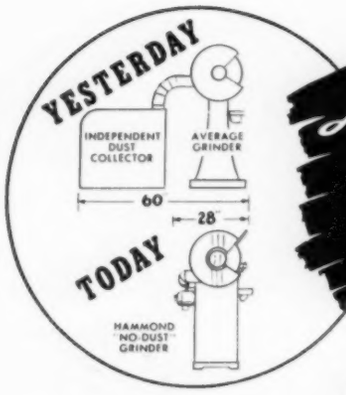

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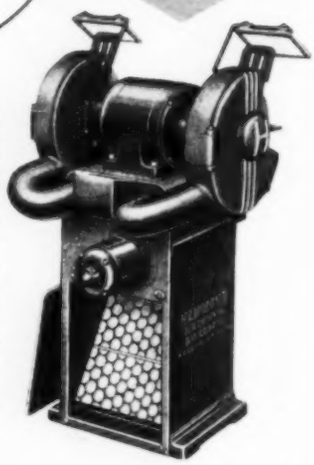

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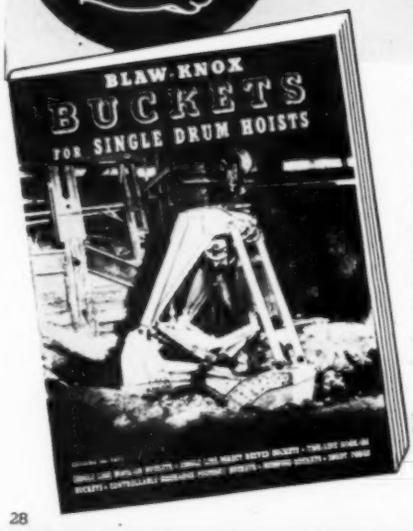

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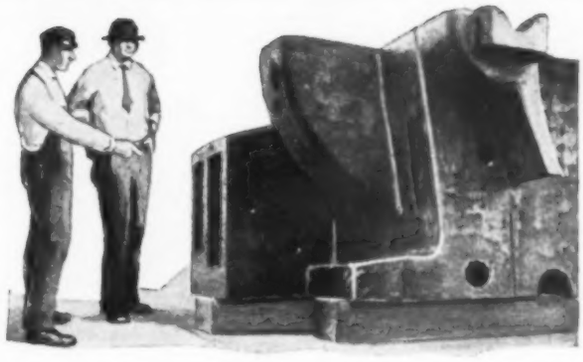

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Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
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Peerless Tools Inc., Milford, Conn.
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Delta Mfg. Co., Industrial division, 695 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.

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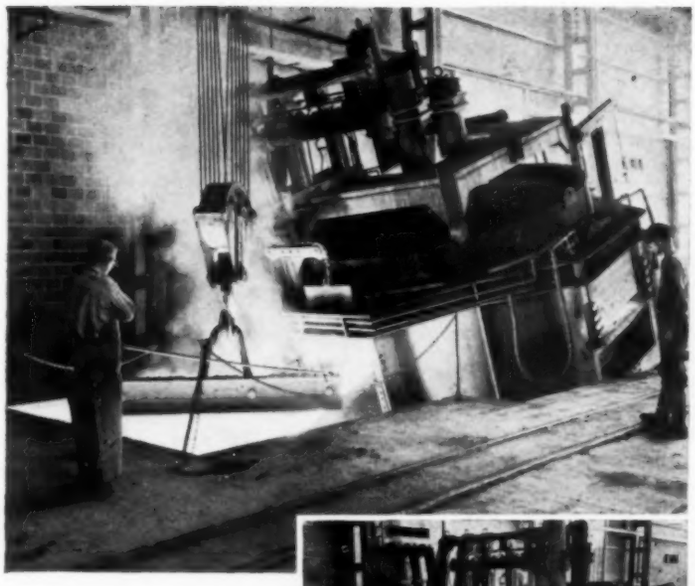

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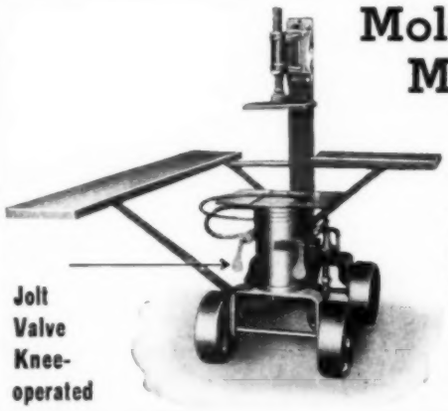

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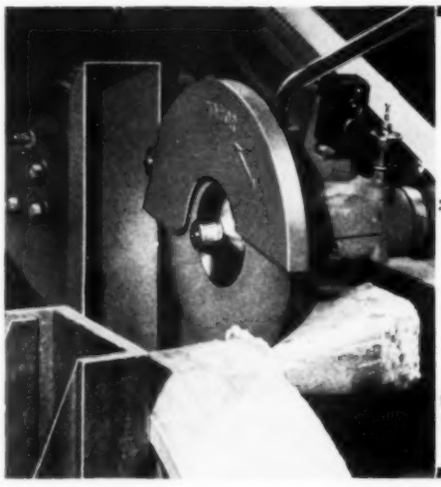

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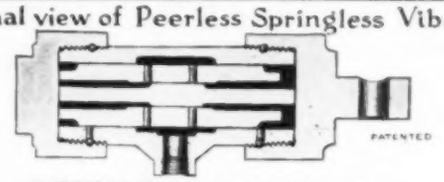

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Steel Foundry and Metallurgical Practice
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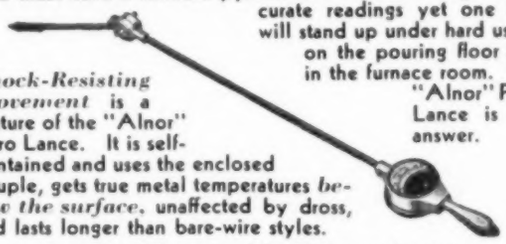
A Reliable Pyrometer is Indispensable

For sound non-ferrous castings . . . and for lower costs . . . you must have a reliable pyrometer . . . one that gives accurate readings yet one that will stand up under hard usage on the pouring floor and in the furnace room. The "Alnor" Pyro Lance is the answer.



Shock-Resisting Movement is a feature of the "Alnor" Pyro Lance. It is self-contained and uses the enclosed couple, gets true metal temperatures *below the surface*, unaffected by dross, and lasts longer than bare-wire styles.

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(Also 24" Size)

riddles sand faster than one can shovel it into the sieve!

Weighing only 135 lbs., it can be shifted about with ease. Suitable for screening molding and core sands, for medium, fine and coarse dry materials. This riddle mixes while sifting, saving one turn of the sand. Correct gyratory motion eliminates vibration.

We also manufacture turret attachments, Swing Frame Grinders, Belt Sanders and Milling Machines. Let us mail bulletins giving full details.

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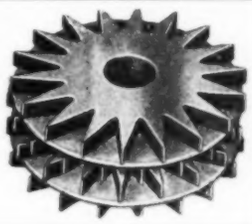
■ We manufacture the only complete line of dressers and cutters. Write for copy of catalog "F" and name of your nearest dealer.



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With no time to be lost, keep war production moving, speed deliveries, save time with Steel-Grip Reinforced Gloves. They handle rough, heavy, jagged materials at breathless pace. Chrome tanned cowhide. Steel ribbon reinforced palm and fingers. Steel thread sewed. Protect against cuts, bruises. Or what's your need? Over 4300 *proved* Steel-Grip Safeguards may give immediate answer. Used by big industrials since 1910. Write for catalog or state your need *today*.

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No. 00, No. 0, No. 1 or No. 2 holes

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Brass or Steel
Slots .010" to .015"

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Preventing burn-in of mold and facing materials in pouring white hot metals...

THE MERIT MARK OF METAL TAM

HOW A TAM PRODUCT INSURES CLEAN CASTINGS OF HIGHLY ALLOYED STEELS

The burning in of mold and facing sand where metal is poured at abnormally high temperatures is a constant source of increased cleaning costs. This is particularly true of highly alloyed steel castings—and is accentuated where the casting has fine detail such as internal threaded cores.

TAM Foundry Zircon Sand offers a practical method for preventing embedded sand, and the subsequent labor of chipping and cleaning. Highly resistant to extreme pouring temperatures, TAM Foundry Zircon Sand does not warp, requires a minimum of venting, yields clean, smooth castings with practically any type of metals—nickel-chrome steels, 18-8 stainless steels, in fact, with any of the highly alloyed steels . . . Can be used for the entire mold or as a facing sand, backed by ordinary sand . . . Has high reclamation value.

TAM Foundry Zircon Flour, used as a mold wash where ordinary flours tend to burn in, is another valuable adjunct to better foundry practice. Full particulars on request. Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., U. S. A.

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for better metals

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For large malleable job order foundry. Good opportunity for qualifying person. Write in detail giving complete story of exact work with various companies, how long a period and references. State age, education, and salary expected. Address Box 625, The FOUNDRY, Cleveland.

REPRESENTATIVES WANTED

Well-known manufacturer of high grade line of plumbago, facings, parting, blacking, core wash and allied foundry items wishes to obtain additional representation by salesmen now calling on foundries regularly. Liberal commission basis. Please advise territory covered, lines now handled, experience with foundry items, etc. Address Box 217, THE FOUNDRY, Cleveland.

LEBANON STEEL FOUNDRY

Has an opening for an

ASSISTANT PLANT ENGINEER

Duties will include construction and maintenance of buildings and equipment.

Applications, giving full information with respect to education and experience and inclosing photograph which will not be returned, should be addressed to:

WALTER S. GIELE,
LEBANON STEEL FOUNDRY
LEBANON, PENNA.

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Wanted two thoroughly competent malleable foundry foremen. We are looking for men with past records of high performance and who are willing to duplicate past good work in a large modern malleable iron plant. Write giving full details as to references and salary required. Address Box 616, The FOUNDRY, Cleveland.

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IN JOBBING FOUNDRY LOCATED IN EASTERN PENNSYLVANIA, PRODUCING STEEL CASTINGS, ELECTRIC PROCESS, RANGING FROM 1 LB. TO 2 TONS, A MAN WHO IS THOROUGHLY FAMILIAR WITH HEADING AND GATING AND HAS A GOOD KNOWLEDGE OF MOLDING AND COREMAKING AND IS CAPABLE OF HANDLING MEN; ACTING IN THE CAPACITY OF ASSISTANT TO FOUNDRY SUPERINTENDENT. IN REPLY, PLEASE STATE AGE, EXPERIENCE AND SALARY DESIRED. ADDRESS Box 619, The FOUNDRY, CLEVELAND.

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CAPABLE OF OVERSEEING THE PRODUCTION OF STRAIGHT CARBON AND ALLOY STEEL CASTINGS—ELECTRIC FURNACE—STEEL FOUNDRY LOCATED IN EASTERN PENNSYLVANIA.

Prefer a man who is familiar with gamma-raying castings and magnetic testing. In reply state age, experience and salary desired. Address Box 602, The FOUNDRY, Cleveland.

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Coreroom supervisor for large nonferrous foundry; experienced in bronze, aluminum or magnesium. Excellent opportunity for right man, New York metropolitan area. American citizens only. Address Box 636, The FOUNDRY, Cleveland.

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WELDING INSTRUCTOR AND OXY-ACETYLENE SUPERVISOR

Wanted in steel foundry cleaning room. Must be graduate engineer with ability to organize and train men. In answering please state age, experience, references and salary expected. Address Box 629, The FOUNDRY, Cleveland.

Help Wanted

PRACTICAL FOUNDRY SUPERINTENDENT

Wanted who is capable of operating small steel foundry in the production of manganese steel castings. Address Box 610, The FOUNDRY, Cleveland.

COREROOM FOREMAN

Jobbing malleable foundry making various sizes of cores wants a man to take charge of coreroom. Must have experience with core blowing machines. Write, state qualifications as to past experience, references, salary, etc. Address Box 596, The FOUNDRY, Cleveland.

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Established foundry supply house wishes to engage the service of additional sales representatives in New England and Ohio. Address Box 572, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN

For Southern California. Must be capable and experienced. Small investment required. Established, prosperous foundry. Attractive future for right man. Address Box 624, The FOUNDRY, Cleveland.

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CAPABLE STEEL FOUNDRY FOREMAN WANTED

By well-established manufacturer, Eastern seaboard, starting steel foundry department. Give all particulars regarding ability, former positions and salary expected and how soon available. Address Box 622, The FOUNDRY, Cleveland.

WANTED

We are seeking a man who has had wide experience in the sale of core oils. If we can find the right individual we will put him in charge of this department. When answering state qualifications fully. All replies confident. Our employees know of this advertisement. Address Box 645, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN WANTED

Man about 35 to 40 years of age for steel foundry producing heavy and medium castings in the Pittsburgh district. In reply state experience in detail. Address Box 631, The FOUNDRY, Cleveland.

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GRAY IRON FOUNDRY MANAGER OR SUPERINTENDENT

Young executive, broad experience, qualified to assume complete responsibility; successful record applying and developing modern, scientific, controlled methods to produce large, heavy castings of superior quality. Confidential information exchanged only with principals interested in a high grade man for a high grade job. Address Box 637, The FOUNDRY, Cleveland.

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Wants charge of gray iron shop running about 15 or 20 tons a day. Thoroughly experienced on cupola practice and, molding on floor, bench squeezer. About five years experience as foundry foreman in jobbing shops. Thirty-nine years old. Address Box 623, The FOUNDRY, Cleveland.

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Positions Wanted

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Having twenty four years as Foundry Superintendent, practical molder, technical education, desires position with foundry making high grade castings. Address Box 583, The FOUNDRY, Cleveland.

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Molding foreman superintendent, molding trade. Reads blueprints, figures weights, costs, torch hardening, riggs. Can match for production, trouble shooter. Thirty years' experience. References A-1. Address Box 643, The FOUNDRY, Cleveland.

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Young gray iron foundry executive with 20 years' experience in all phases of foundry work now employed desires a change. Able to take complete charge of any production or jobbing foundry. Has also a good knowledge of steel. Excellent technical training. Best of references. Address Box 642, The FOUNDRY, Cleveland.

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Classified Advertising

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WANTED TO BUY

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Large foundry in excellent condition.

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36-inch cupola, tumbler, crane, core oven, patterns, molding boxes, etc. Also, two brass pits, etc. **Riverside Foundry, 606 Merchant St., Port Huron, Michigan.**

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FOR SALE

Completely equipped iron foundry, ready to operate. 48" cupola, large core oven, 5 ton crane, on railroad siding. For particulars write or phone, **Square Deal Metal Company, Owosso, Michigan.**

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REBUILT COMPRESSORS AND BLOWERS

2800 CFM, @ 1 lb. North American Turbo Compressor with 20 H.P., 3600 RPM A.C. motor.

1250 CFM, @ 3¼ lbs., 3600 RPM Gen. Elec. with 30 H.P. A.C. motor drive.

(3) Buffalo Forge Pressure Blowers, 1200 cfm @ 11 oz., 9½" inlet, 7 x 7 outlet, driven by 7½ H.P. A.C. Motors.

450 CFM, 3500 RPM Gen. Elec. with 6.2 H.P. A.C. motor drive.

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The Motor Repair & Mfg. Co.

1552 Hamilton Ave. Cleveland, Ohio

For Sale

FOR SALE

Air Rammers
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1—2 Ton Worm Gear Ladle
1—3 Ton Worm Gear Ladle
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Rebuilt motors, all sizes which are guaranteed
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1—type "R" 24 x 10 hand operated
3—type "HJ" 20 x 6
1—type "HJ" 16 x 4
1—type "R" 20 x 8
12—type "JS" 2 jolt squeezers

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34—"J75" Squeezers
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Jolt Rollover Machines

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1—42" Cupola
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1—Gardner Air Compressor, 6 x 6, belt driven with Lincoln motor, 2 HP 220v.
12—Brillion Iron Pouring Devices
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2—Grinders Motor Driven
1—Royer
1—Gas Heat Treat Oven
4—Core Racks
1—Beardsley & Piper Stationary Sand Slinger, never used

HAYNES FOUNDRY EQUIPMENT CO.

1734 Lake Street Kalamazoo, Mich.

REBUILT

BLOWERS—FANS—EXHAUSTERS

Roots-Connersville positive cupola blowers. Centrifugal blowers for gas and oil burning. Sand blast, grinder and dust exhausters. Ventilating fans.

GENERAL BLOWER COMPANY

406 N. Peoria St. Chicago, Illinois

Classified Advertising

For Sale

FOR SALE

Allis-Chalmers single stage, overhung type, turbo-blower, rated 2600 C.F.M. 1.25 lb. discharging pressure, complete with 20 h.p. motor and Foxboro air weight control. This blower now in use and can be seen in operation on a cupola lined to 28-32 inches. Reason for sale: Must enlarge cupola. Buying larger blower. This blower has been in actual use less than 400 hours and is in perfect condition. **Jamestown Malleable Iron Corporation, Jamestown, New York.**

FOR SALE

A Standard pour crane ladle, having a capacity of 2850 pounds of iron when lined one and one-half inch on inside and bottom, and with two and one-half inch top allowance, with gear pouring, with price to sell. **Mitchell Machinery Co., Canton, Illinois.**

FOR SALE

Royer model D. C. combination scrap remover, sand separator and blender.

THE ELYRIA BELTING & MACHINERY CO., ELYRIA, OHIO

FOR SALE

PANGBORN SANDBLAST BARREL

Type GH1 No. 3

In good condition. Inquire

National Foundry Company of New York, Inc.
10 Sandford Street, Brooklyn, N. Y.

EQUIPMENT IN STOCK

GUARANTEED IMMEDIATE SHIPMENT

MOLDING MACHINES

(1)—No. 276-J Osborn 13" Jolt Squeezer
(1)—Tabor Jarr Squeeze Flask Lift Stripper Table 18" x 20½"
(1)—No. 81 Osborn Jolt Squeeze Stripper Machine
(1)—Osborn No. 602 Jolt Rollover Pattern Draw
(1)—International Jarr Table 24" x 36"
(4)—Herman Jarr, Table 40" x 60"
(4)—Herman Jarr Strippers Table 40" x 60"
(6)—Herman Jarr Rollover Pattern Draw, Table 30" x 36", 40" x 55", 40" x 60".
(1)—40" x 50" Tabor Jarr Rollover Pattern Draw

MISCELLANEOUS ITEMS

(1)—Gas Fired Young Bros. Core Oven 12'6" deep, x 8' wide x 7'6" high, double doors.
(1)—¾" Cap. Shuster Power Sprue Cutter
(1)—Dings Magnetic Separator type M-1

SAND MIXERS

(1)—10-cu. ft. Standard Gear Drive
(1)—8-ft. Simpson Mixer
(1)—4-ft. Simpson Mixer

AIR COMPRESSORS

(1)—12 x 10 Penna. 360-CFM. @ 100 lbs. idler, belt, 60-HP. C.W. slip ring motor, 220/3/60-cy. & control
(1)—12 x 12 Chicago N.S.B. 375-CFM. @ 100 lbs. with idler, unloader and lubricator.
(1)—2-stage Ing. Rand size 16 & 10½ x 12 cap. 770-CFM @ 75 lbs. direct connected to a 125-HP. G.E. Syno. motor, 2300/3/60-cycle, exciter, control, after cooler and tank.

ELECTRIC MONORAIL HOISTS

50—½ to 5-ton, 1 and 2-motor, Fl. and Cage operated, 200-400-volts, 3-PH. 60-CY. 110 and 230-VDC.

OVERHEAD ELECTRIC TRAVELING CRANES

1 to 50-ton Cap. 18' to 91'0" span, 220/440-VAC and 230-VDC. We operate the largest crane Rebuilding Plant in the country, send us your specifications for Cranes, Electric Monorail Hoists, Crane Motors, Standard Motors, Steel Buildings and Runways, we can quote you on equipment Rebuilt to your specifications.

ELECTRIC STEEL FURNACE

(1)—3-ton Heroult, with 1500-KVA Transformer, 2300-volts, 3-phase, 60-cycle, Rebuilt To Your Specifications.

T. B. MacCABE CO.

4304 Clarissa St. Philadelphia, Pa.

For Sale

Are **YOU** in need of foundry equipment?

Do **YOU** have equipment to sell?

Are **YOU** looking for experienced men?

Do **YOU** want to obtain a position?

If **"Yes"** is your answer to any of the above questions, may we offer the services of the Classified Advertising Department of The FOUNDRY? For rates write *today* to:

The FOUNDRY

Classified Advertising Department

Penton Building Cleveland

REBUILT USED EQUIPMENT

Molding machines, all types; tumbling mills; furnaces; cupolas; air compressors; hoists; rammers, all types; ladles, all types; sand mixers; sand blast tanks; core machines, etc. All equipment rebuilt and guaranteed. All sizes used steel flasks.

HAYNES FOUNDRY EQUIPMENT COMPANY
1734 Lake St. Kalamazoo, Mich.

FOR SALE

Odd size skim gates. Consists of clippings and shearings of perforated tin plate in mixed sizes suitable for use as skim gates. Packed in 100 lb. kegs. Price 12½c per lb. f.o.b., Geneva, Illinois. **Smith & Richardson Mfg. Co., Geneva, Illinois.**

FOR SALE

1—Practically new Wilbraham cupola blower, geared to 50 h.p.—G. E. motor, mounted on cast iron base.....$480.00
1—Phillips-McLarens wet pan muller, belt drive.....$280.00
1—No. 101 Osborn jolter.....$65.00
For complete list of equipment and description write:

E. A. MEYER
Green Bay, Wisconsin

FOR SALE

Dings No. 2 magnetic separator, with direct connected motor and generator, arranged for 220 volt, 25 cycles—can be supplied with motor to suit voltage of customer. Address Box 620, The FOUNDRY, Cleveland.

FOR SALE

One used Beardsley & Piper eleven foot traction type sandslinger with nine foot ramming arm and 16 inch head. Address Box 647, The FOUNDRY, Cleveland.

FOR SALE

Fifty-inch exhauster direct motor drive on extended base complete. Good condition. Address Box 627, The FOUNDRY, Cleveland.

FOR SALE

1—No. 10 Paxson Colliau cupola, substantially new. **Montague Machine Company, Turners Falls, Mass.**

For Sale

AIR COMPRESSORS

BELTED—176 ft., 355 ft., 540 ft., 676 ft., 752 ft. & 1300 ft.
ELECTRIC—355 ft., 528 ft., 676 ft., 807 ft., 1302 ft., 1723 ft., 2022 ft., 2200 ft., 2800 ft., 3600 ft., & 5000 ft.
STEAM—368 ft., 500 ft., 800 ft., 1221 ft., 1640 ft., 2200 ft., & 3000 ft.
DIESEL—368 ft., 603 ft., 900 ft. & 1300 ft.
GASOLINE—110, 160, 220, 310, 1300 ft.

R. C. STANHOPE, INC.

60 East 42nd St. New York, N. Y.

FOR SALE

One complete mold conveyor and overhead sand handling system manufactured by C. O. Bartlett & Snow Co., Cleveland, Ohio. Also tumbling barrels, dust arrestors, sandblast barrels, and other miscellaneous foundry equipment. Address Box 574, The FOUNDRY, Cleveland.

FOR SALE

1 Herman Pneumatic 42" Dia. jarr molding machine, bumper type, equipped with auto pressure grease lubrication, air tank 12" dia. x 6' long. Serial No. 2838, never operated. **East Penn Foundry Company, Macungie, Pennsylvania.**

FOR SALE

1 Whiting U shaped mixing and desulphurizing ladle. Capacity 2700 pounds iron. Condition good as new. **Barnett Foundry & Machine Co., Irvington, N. J.**

SPECIAL WINTER BARGAINS

Air Compressor Units—Curtis 6 x 6 twin with 15 HP motor and starter-tank-belt and unloader 87 CFM displacement.

Ingersoll-Rand 10 x 10 with 40 H.P. Motor.

Fans—Blowers—Exhausters for cooling, ventilation and dust or fumes removal. Multivane Fans in all st'd. makes and styles for large air volumes at low pressures.

Fan or **Centrifugal** style blowers—Maxon-Premix—from No. 1 to No. 6, Spencer Turbine, Gen. Electric, Am. Blower Co., Sturtevant, Buffalo, Clarge, Ilg etc. for Gas or Oil fuel Combustion.

Rotary Pressure Blowers — Roots-Connersville, Garden City, Green, Piqua, Sturtevant, Am. Gas Furnace Co. etc.

Cupola 30" dia. shell ¾ to 1 ton cap. and larger.

Furnaces for Brass and Aluminum Melting—Hausfeld Tilting open flame 400 lb. brass cap.; Booth Electric 725 lb. brass cap. with instruments and transformer. Stationary Furnaces, swing top for crucibles No. 6 to No. 150 and open top for iron pots up to 300 lb. aluminum.

Schwartz Furnaces—1—60" & 1—42".

Molding Machines—Osborn No. 401 stationary, jolt-squeeze-rollover-draw 20" x 30". Osborn No. 404-S, No. 405-S and No. 85 Pit Type jolt-squeeze-strippers. Arcade No. 3 "Modern" portable hand operated rollover draw, underneath runout carriage. "Berkshire" 34" wide stationary air squeeze. "Tabor" 8" cyl. air squeeze. "Battenfeld" (Johnston & Jennings) stationary jolt squeeze; 5 in stock. Arcade— portable 2 in stock 8 & 10" cyl. Adams—Stationary hand squeezers 48" wide 2 in stock. Mumford—Stationary Air Squeeze 14 x 18" platen. Tabor—Hand operated, portable, Rollover, draw for 20 x 30" flasks or core boxes, 3 in stock. Nichols—10" x 32" Stationary 20 available. Tabor 28" x 41" portable shockless jarring rollover draw.

Crane Ladles 1 & 4 ton, Sly wet Cinder mill.

Sand Blasts—pressure generator tanks with hose & nozzles.

Sand Blast Barrel—New Haven 36 x 46" Motor direct connected.

Sand Blast Tables Pangborn 6' and 8' dia. self contained fine for brass and iron castings.

Blystone Style Sand Mixer. 5 cu. ft. cap.

Combs Sand Riddles—2—type V & 1—type CS

Tell us your needs.

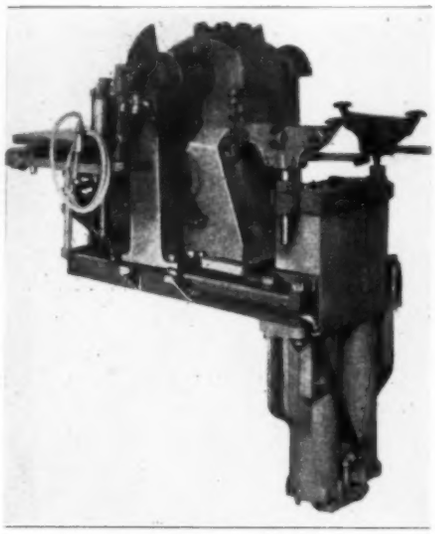
CLIFTON MACHINERY CO.
1023 W. 6th CINCINNATI, O.

"SCULLY-JONES" RECONDITIONED FOUNDRY EQUIPMENT

◆ Ready for immediate shipment, this equipment has been completely rebuilt in our modern machine shop. Prices on request.

INTERNATIONAL MOLDING MACHINES

1 49 x 16" draw Type "F," fitted with air equalizers, rollers in the draw section and hand operated core box clamps, jar plate 100" long, 6000 lbs. cap.



INTERNATIONAL TYPE "F"
(Enclosed Model)

48 x 16" draw Type "F"—4200 lbs. cap. @ 80 lbs., table size 48 x 83".
37 x 16" (adjustable draw, can be set to max. of 25") Type "F" table size 34 x 70", 3800 lbs. cap. @ 80 lbs. press.
31 x 16" draw, Type "F" table size 31 x 60", 2500 lbs. cap. @ 80 lbs. pres., with roll-off table and air equalizers.
42 x 16" draw Type "F" (with double cylinders) 3400 lbs. cap. @ 80 lbs. pressure.
27 x 12" Type "F" International (enclosed cyl. type) 1400 lb. roll-over capacity @ 80 lbs. pressure

OSBORN MOLDING MACHINES

No. 403-W Osborn jolt roll-over and pattern draw, flask cap. 52 x 36", 12" draw, with swing-out Mold Table, Power Roll-Over.

No. 602 Osborn jolt roll-over pattern draw, flask cap. max. length 36"—width 26"—11" draw, 900 lbs. jolt cap.

Herman INDEPENDENT TURN-OVER and PATTERN DRAWING DEVICE MACHINES

32 x 46" jar roll-over, 30 x 36" jolt table.
46 x 56" jar roll-over, 40 x 50" jolt table.
40 x 60"—15" dia. cyl. 9500 lbs. cap. @ 80 lbs. press., 42 x 60" jolt table.

GRIMES—MILWAUKEE

Grimes Model K-614 roll-over, 6" cyl. 1000 lbs. cap. @ 80 lbs. max. width of flask 32" max. length 48"—14" pattern draw.

No. 832 Milwaukee hand jolt and roll-over, foot draw, portable, 30" height pattern table, max. draw 8" 15 x 32" table.

HERMAN BUMPERS

60 x 72" table, 15,000 lbs. cap. @ 80 lbs. press., 19⅛" dia. cyl.
50 x 50" table, 6100 lbs. cap. @ 80 lbs. pressure.
40 x 50" table, 6400 lbs. cap. @ 80 lbs. press., 13" dia. cyl.

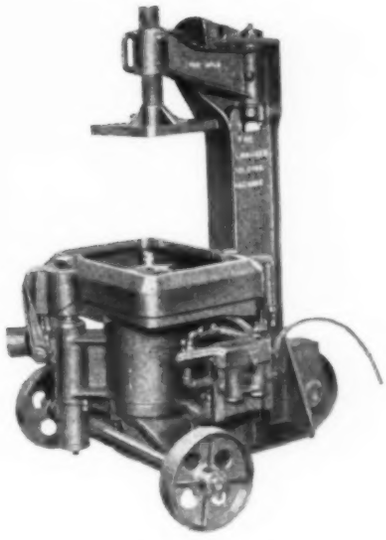
POWER STRIPPING PLATE MACHINES

International Type "TJ" 16 x 16 x 10" draw comb. jolt ramming, power strip.
International Type "TJ" 24 x 24 x 10" draw.
No. 24 Davenport JOLT STRIPPER, stationary, 24 x 24" jolting table, 8" draw, 1500 lbs. stripping cap., strip pin centers 24 x 27".

JOLT SQUEEZE & POWER STRIP

No. 142 Milwaukee, stationary, stripping cap. 1200 lbs. @ 80 lbs. press., draw 6" table 19 x 35"—open end type.
No. 152 Milwaukee, portable, max. pattern draw 6", pattern length 28" width 20", 1200 lbs. cap. @ 80 lbs. press., 22 x 30⅛" table.
No. 703-6 Osborn jolt squeeze and strip, 21 x 28" table, stationary, length of opening in lifting frame 34", 6" pattern draw, 8" cyl. dia. 1000 lbs. jolt. cap. @ 80 lbs. pressure, distance from lifting frame to squeeze head 24¼", flask length 44½", with roll off conveyor.
No. 703-5 Osborn, same as above excepting 17 x 35" table.

JOLT SQUEEZE STRIP



Milwaukee No. 113, portable, 500 lb. cap. @ 80 lb. press. 6" pattern draw, 16" x 26" table —platen size 12" x 14"—max. pattern length 24".
Milwaukee No. 113, portable, 500 lb. cap. @ 80 lb. press. 6" pattern draw, 16" x 35/ table, open end type, platen size 12" x 14".

SAND MIXERS-CONDITIONERS-THROWERS

No. 2, 6 ft. dia. Simpson, double muller type, pulley drive.
No. 3, 8 ft. dia., 11 x 32" heavy duty type double Mullers, arranged for motor drive, but without motor, with gear reduction and outboard bearing.
Model "B" Royer Sand Separator and Blender, cap. 300 lbs. sand per min., portable, with AC Motor.
Model "D" Royer Sand Separator and Blender, 800 lbs. sand cap. per min., portable with 3/60/220V AC Motor.

SPENCER TURBO COMPRESSOR BLOWER

Spencer-Turbo-Comp. Blower, No. 1507, 675 CFPM @ 24 oz. pressure, 12" opening, direct connected to 7½ HP Westinghouse 3-60-220V AC 1750 RPM Motor.
Spencer-Turbo Comp. Blower, No. 1510, 900 CFPM @ 24 oz. pressure, 12" opening, direct connected to 10 HP Westinghouse 3-60-220V AC 1750 RPM Induction Motor.

Dings Inclinable BELT CONVEYOR 125V, speed 40-50, Type H, 3/60/220V AC, 10 ft. centers, 12 x 20" MAGNETIC PULLEY complete with FEED HOPPER and Speed Reducer.

OVERHEAD ELECTRIC TRAVELING CRANES

25-ton Walker 55 ft. span with 5-ton Aux. cage control, motors 550V DC, chain on main hoist and cable on Aux. girders single web construction, truck ends steel wheels.

7½-ton Bedford, 55 ft. span, 2-motors, 220V DC, cab control (same as 3-motor type, Trolley Travel and Hoist-same motor, by means of clutch).

5-ton Toledo 31'7" span Type of Girders 20" "I" Beam 6" face, channel on top 15" 3-motors, 115V DC, cab controlled.

5-ton Bedford, 28 ft. span, Straight "I" Beam Type Girders, cab control, 220V DC Motors, cut steel pinions and gears.

5-ton Shepard 18'5" span, 1-motor 220V DC, trolley hand racked, bridge hand racked, box girders.

2-ton Detroit LoHed Ice House Type, 26 ft. span, 3-motors, 220V AC, floor control, 9-10 ft. lift.

1-ton Detroit LoHed Type "H" Ice House Cranes, 29 ft. span, double "I" Beam Girders, 220V AC, floor control, 9 ft. vertical lift.

ELECTRIC HOISTS

1000 lb. Shepard, 1 HP 110V DC Motor, with Trolley, 14 ft. lift.

2000 lb. Y&T Model 20B Elec. Chain Hoist, 16 ft. lift, 220V AC Motor, floor cont.

2000 lb. Shepard equipped with 2¼ HP 110V DC Motor, 18 ft. lift, floor cont.

2000 lb. Shepard Lift-A-Bout with Trolley, 2¼ HP 110V DC Zobell Motor, 18 ft. lift, floor control, speed 20 FPM.

2000 lb. Northern Hi-Lift lug suspension type for fixed suspension, with 2 HP 220V AC Motor, 20 ft. lift.

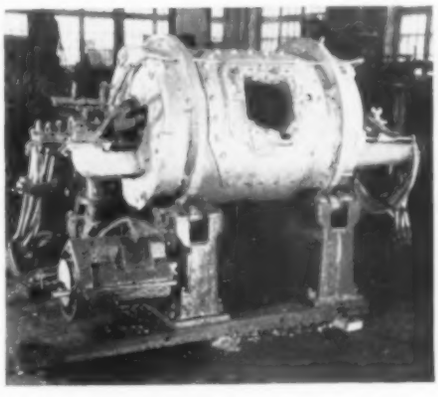
2-ton American No. 2, equipped with Ideal Elec. 3/60/440V AC Motors, 1½ HP Trolley and 3 HP Hoisting motor.

2-ton Shepard, stationary, with remote cont. for mounting, with 20 HP 220V AC Motor—speed 80 FPM.

5-ton Detroit, with Top Hook, floor cont. with 5 HP 230V DC Motor.

7½-ton DETROIT equipped with 6½ HP Watson 230V DC Motor.

DETROIT ELECTRIC FURNACE



Detroit 350 lb. Rocking Type ELECTRIC FURNACE complete with Transformer 200 KVA, 2700 volt, 90 volt secondary, oil circuit breaker and instrument panel.

ELECTRIC SCREENS

Hum-mer (W. S. Tyler Co.) Electric Screen, has only one deck or single screen 48" wide x 60" long, open type, mounted on four wheels, including Generator, 2 HP 3-60-440V 870 RPM W. S. Tyler Type BF1-KVA 1.1, KW 45, 115V Cutler-Hammer Max. Amp. 6, 250 Ohms Rheostat.

Above items represent but a portion of our used or reconditioned FOUNDRY and INDUSTRIAL EQUIPMENT BARGAINS . . . Send for our current STOCK LIST No. 69 (just printed) which shows COMPLETE STOCK on hand at our CHICAGO WAREHOUSE and advise as to your exact requirements.

SCULLY-JONES & COMPANY (Foundry Division) 19th & ROCKWELL STS.
PHONE LAWNDALE 8770 — CHICAGO, ILLINOIS

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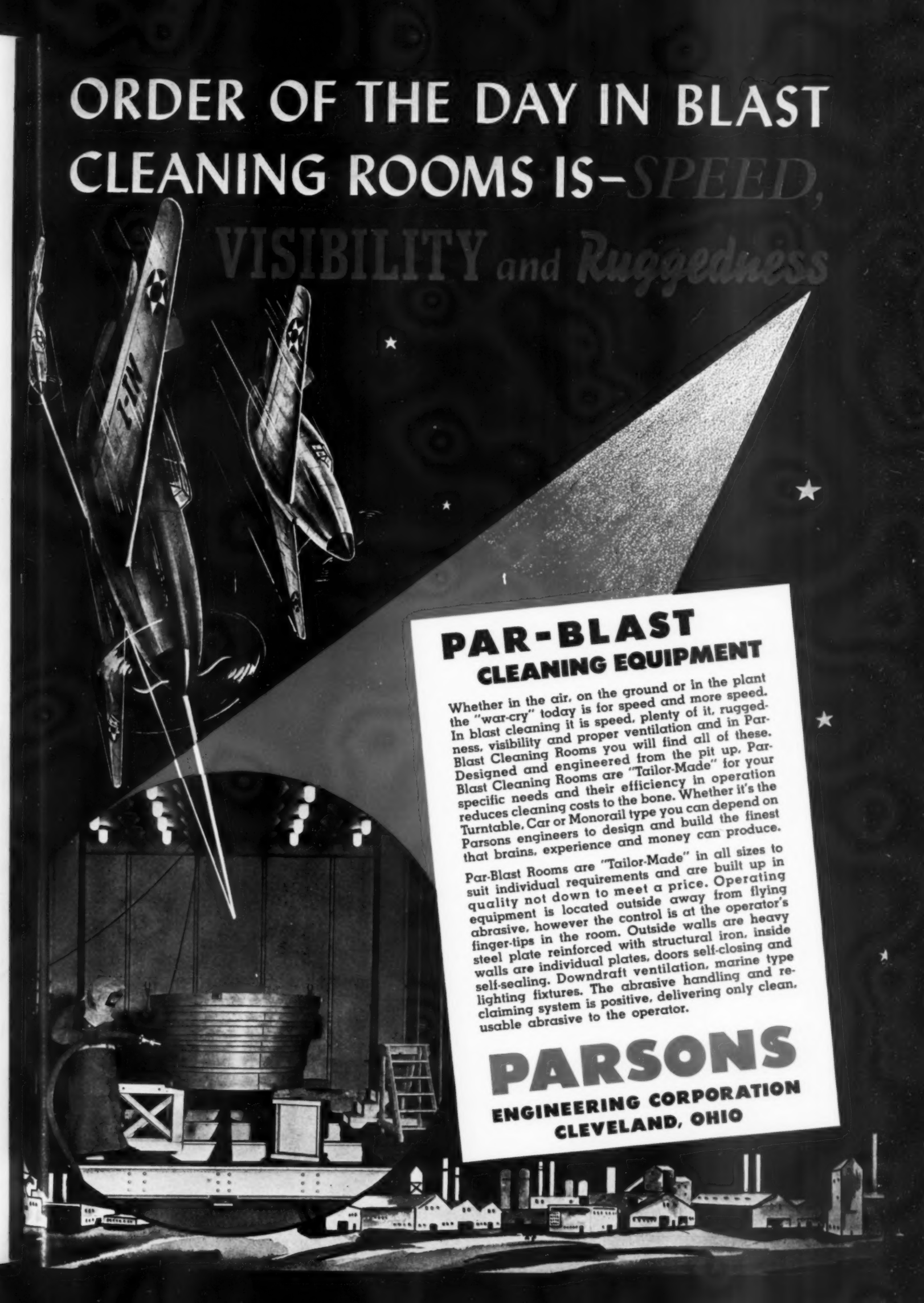
ORDER OF THE DAY IN BLAST CLEANING ROOMS IS—*SPEED, VISIBILITY and Ruggedness*

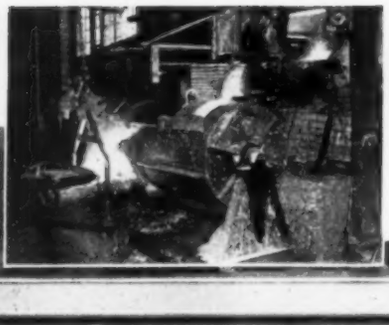


PAR-BLAST
CLEANING EQUIPMENT

Whether in the air, on the ground or in the plant the "war-cry" today is for speed and more speed. In blast cleaning it is speed, plenty of it, ruggedness, visibility and proper ventilation and in Par-Blast Cleaning Rooms you will find all of these. Designed and engineered from the pit up, Par-Blast Cleaning Rooms are "Tailor-Made" for your specific needs and their efficiency in operation reduces cleaning costs to the bone. Whether it's the Turntable, Car or Monorail type you can depend on Parsons engineers to design and build the finest that brains, experience and money can produce.

Par-Blast Rooms are "Tailor-Made" in all sizes to suit individual requirements and are built up in quality not down to meet a price. Operating equipment is located outside away from flying abrasive, however the control is at the operator's finger-tips in the room. Outside walls are heavy steel plate reinforced with structural iron, inside walls are individual plates, doors self-closing and self-sealing. Downdraft ventilation, marine type lighting fixtures. The abrasive handling and reclaiming system is positive, delivering only clean, usable abrasive to the operator.

PARSONS
ENGINEERING CORPORATION
CLEVELAND, OHIO



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Modern-engineered Pouring and Mixing Ladle installation at the Vulcan Foundry Company, Oakland, California.

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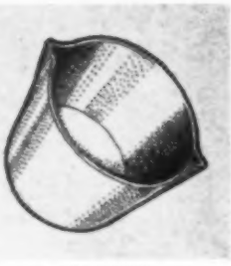
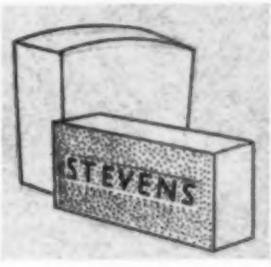

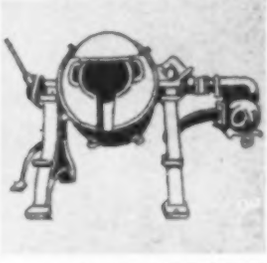
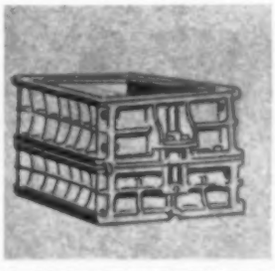

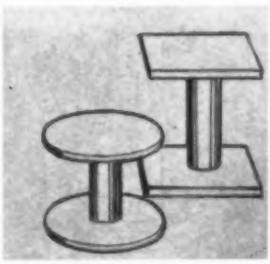
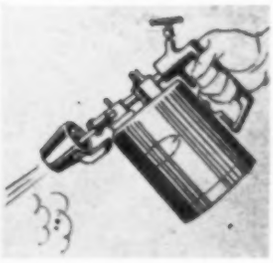

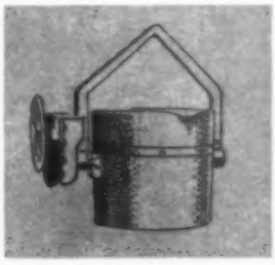

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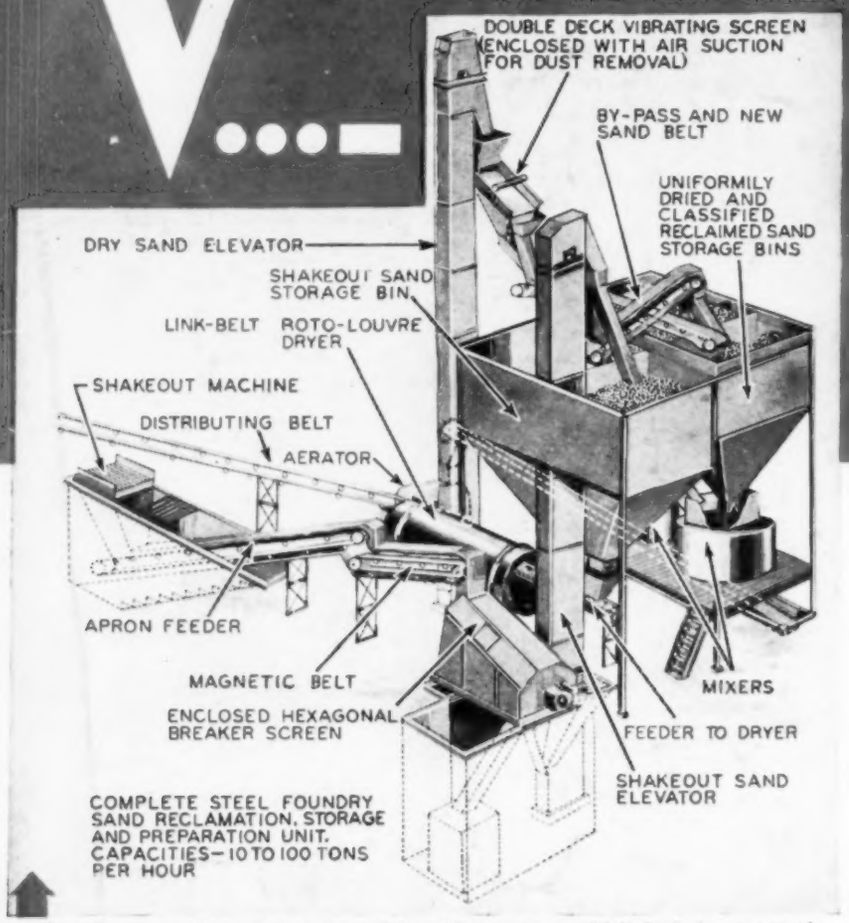
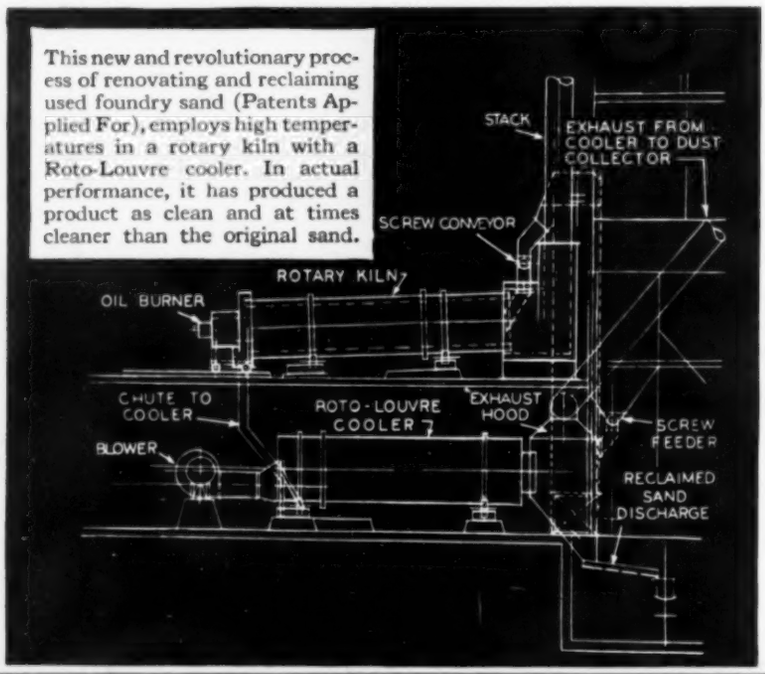
STEVENS

Advanced Techniques in Sand Preparation That Aids War Production


DOUBLE DECK VIBRATING SCREEN (ENCLOSED WITH AIR SUCTION FOR DUST REMOVAL)
BY-PASS AND NEW SAND BELT
UNIFORMLY DRIED AND CLASSIFIED RECLAIMED SAND STORAGE BINS
DRY SAND ELEVATOR
SHAKEOUT SAND STORAGE BIN
LINK-BELT ROTO-LOUVRE DRYER
SHAKEOUT MACHINE
DISTRIBUTING BELT
AERATOR
APRON FEEDER
MAGNETIC BELT
ENCLOSED HEXAGONAL BREAKER SCREEN
MIXERS
FEEDER TO DRYER
SHAKEOUT SAND ELEVATOR
COMPLETE STEEL FOUNDRY SAND RECLAMATION, STORAGE AND PREPARATION UNIT. CAPACITIES—10 TO 100 TONS PER HOUR

Here is a complete shakeout-sand handling system which includes magnetic separator, enclosed revolving breaker screen and a Roto-Louvre Dryer ahead of classifying screens. It provides positive control of fines removal and grain size classification with proper storage, mixing and distributing facilities. Similar units can no doubt be adapted to suit your particular conditions.

This new and revolutionary process of renovating and reclaiming used foundry sand (Patents Applied For), employs high temperatures in a rotary kiln with a Roto-Louvre cooler. In actual performance, it has produced a product as clean and at times cleaner than the original sand.



The three sand preparation and reclamation systems described on this page are recent Link-Belt developments. Perhaps one of them can be adapted to conditions in your foundry with corresponding benefits. Consult our nearest office.

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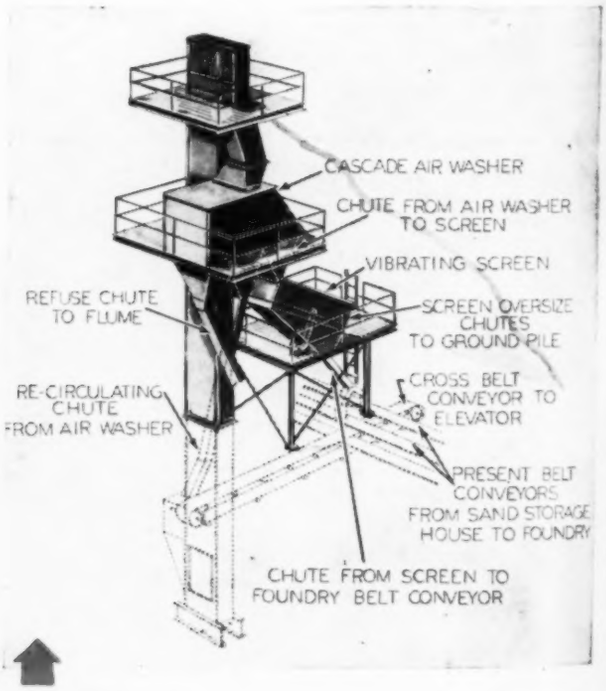
CASCADE AIR WASHER
CHUTE FROM AIR WASHER TO SCREEN
VIBRATING SCREEN
REFUSE CHUTE TO FLUME
SCREEN OVERSIZE CHUTES TO GROUND PILE
RE-CIRCULATING CHUTE FROM AIR WASHER
CROSS BELT CONVEYOR TO ELEVATOR
PRESENT BELT CONVEYORS FROM SAND STORAGE HOUSE TO FOUNDRY
CHUTE FROM SCREEN TO FOUNDRY BELT CONVEYOR

This handling and preparation unit, recently installed in a steel foundry, employs mechanical screening in combination with air classification. It reclaims shakeout sand which is used for "facing" on a large majority of their jobs, thus effecting large savings in the cost of new sand.

LINK-BELT *Sand Preparation* **EQUIPMENT**